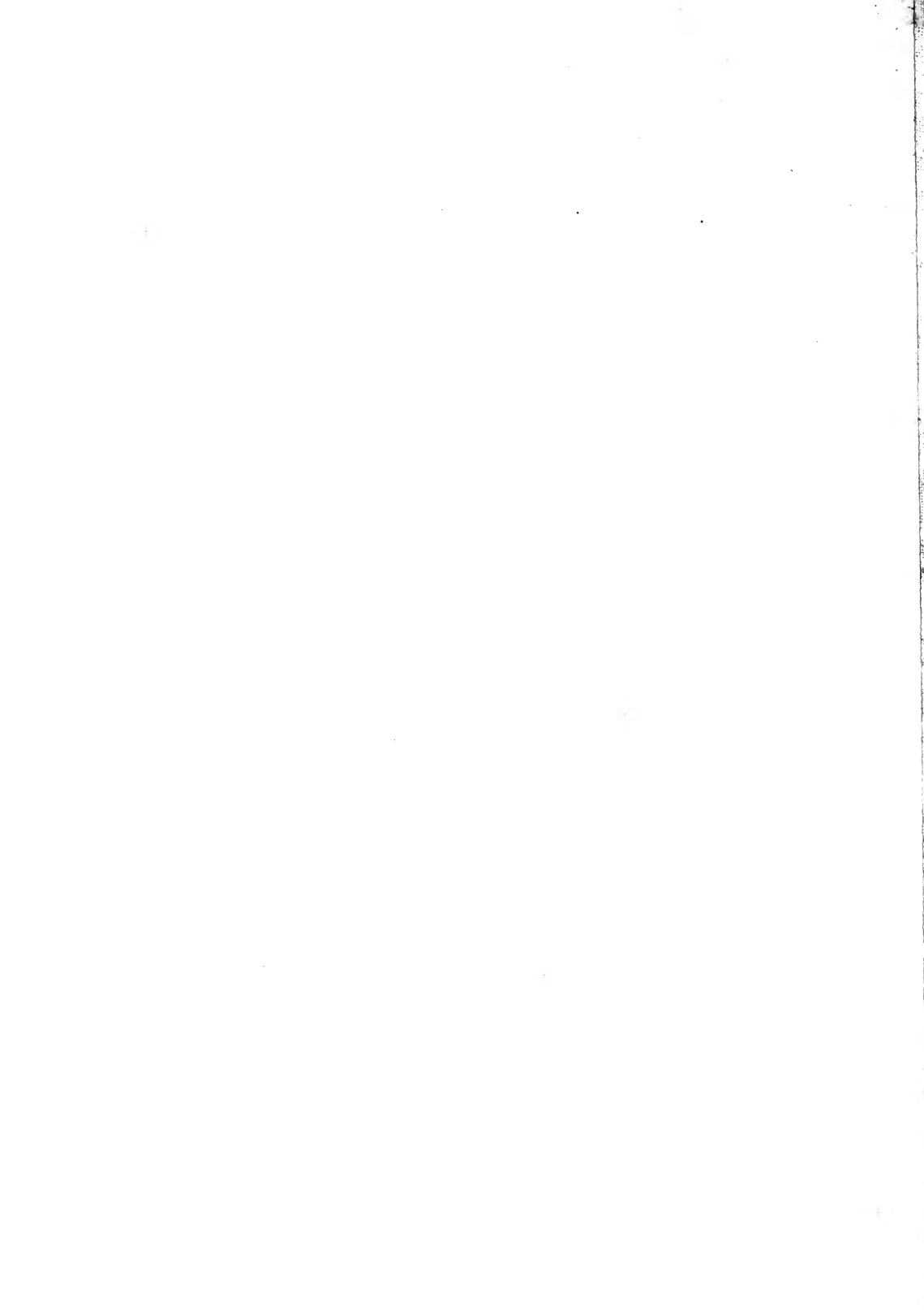
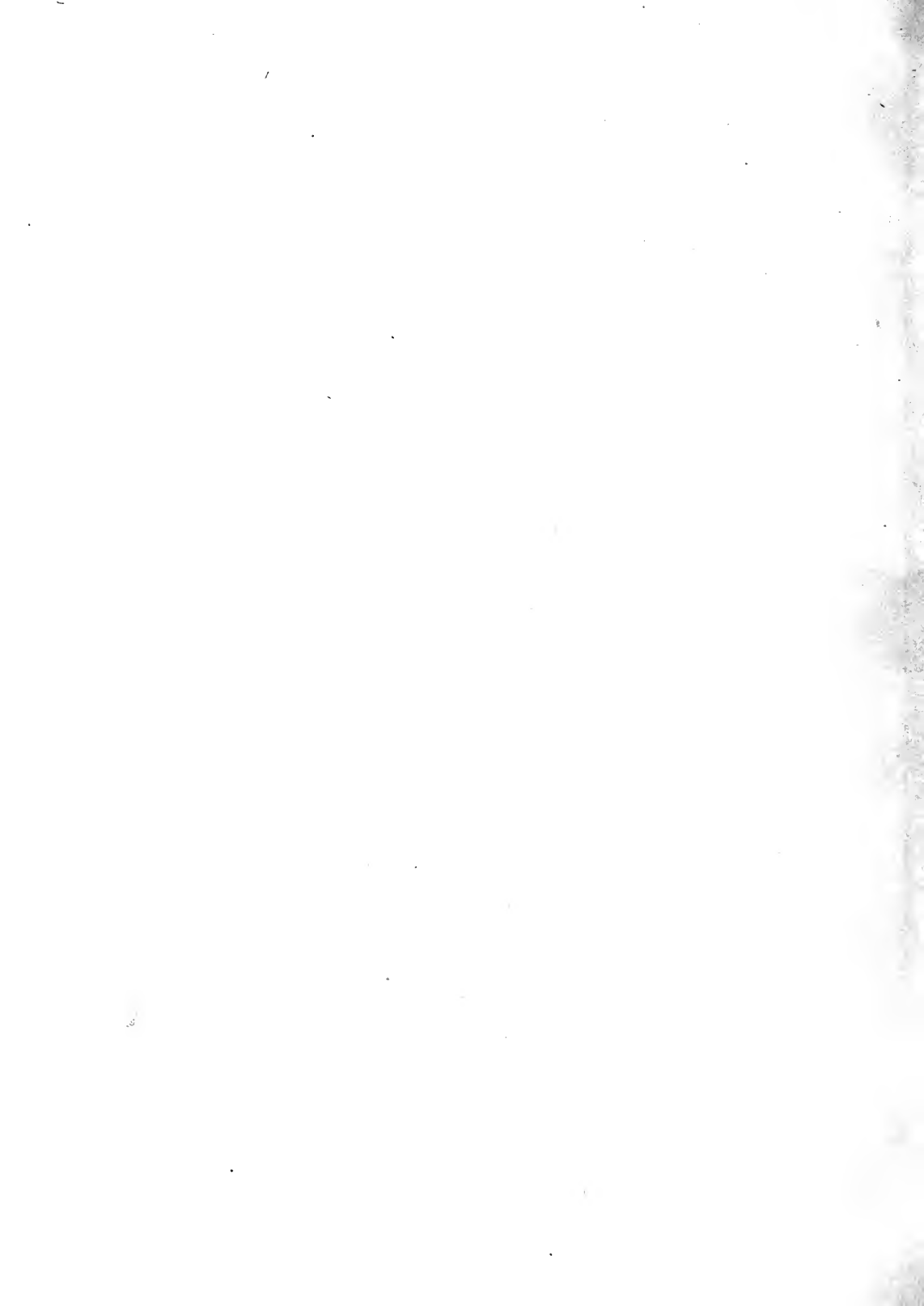


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The Journal OF Nervous and Mental Disease

AN AMERICAN JOURNAL OF NEUROPSYCHIATRY

FOUNDED IN 1874

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The Journal OF Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

EXISTING TENDENCIES, RECENT DEVELOPMENTS AND CORRELATIONS IN THE FIELD OF PSYCHOPATHOLOGY *

BY WILLIAM A. WHITE, M.D.

OF WASHINGTON, D. C.

In a thoughtful survey of the work which has been produced during the past few years in the field of psychopathology, one is perhaps first impressed with its quantity, and correspondingly, as is to be expected, with the great mass of material of negligible value and the few works that stand out as real, worth-while contributions. This state of affairs, though, is of course the rule, and is always to be expected except at times of unusual development such as generally follow a revolutionary new formulation, such as that of evolution or Darwinism. Of course, we are really living in such a time, and Freud's contribution may very properly be considered of as great importance to psychopathology as Darwin's was to biology, and the literature is now rich with contributions which have grown out of the stimulus of the psychoanalytic point of view. Still, standing as close as we do to his great work, we lack perspective somewhat, and are more impressed perhaps with the quantity of mediocre material which the stimulus has produced than the really more important fact, namely, that it has streamed through every aspect of the psychopathological realm and modified our whole method of thinking of these problems. At the same time similar tendencies of mind have manifested themselves in other departments of science and thought, and the two have often come together and reinforced each other.

When I say similar tendencies of mind I mean tendencies towards a dynamic approach to problems of science, of art, of philosophy, as

* Presidential address, The American Psychopathological Association, Washington, D. C., May 1, 1922.

opposed to the older, more definitely static ways of thinking of processes and things. Old distinctions, such as those between soma and psyche and between normal and pathological, are breaking down and releasing new interests which are slowly, perhaps, but surely, profoundly changing the way of thinking of psychopathological problems.

While this is deeply true, still the outward form of psychiatry, that is, its nosological compartments, remain approximately the same and with very much the same labels. New methods of classification, more especially the mechanistic scheme of Kempf,(1) have not replaced that of Kraepelin. The terminology of Kraepelin continues its hold partly perhaps from inertia, but probably more because his terms present more or less concrete pictures to the mind, and whether those pictures be right or wrong, they are more acceptable than terms which are more abstract and vague, even though perhaps logically and scientifically more sound. The Kraepelinian classification seems to include a greater number of factors that are desirable than any other, and also to make certain concessions to practical needs that indicate that it will hold sway for some time to come.

While this is a general statement of the situation, as might be expected, there are certain tendencies which are visible in the literature which are not so simply stated, but which can perhaps best be understood when so backgrounded.

In the first place there are those who slavishly follow the Kraepelinian scheme, of course, more particularly where that scheme is most definite, as in the paranoia, manic-depressive, and dementia precox formulations. Bleuler(2) has very well pointed out the danger from such a restricted viewpoint in his criticism of Rüdins(3) study of heredity in precox, more particularly by showing how his too rigid formulation of precox overlooks many larvated or undeveloped cases that never get into institutions, many who never develop a characteristic schizophrenic picture or remain well under exceptionally favorable circumstances, but all of whom may be the bearers of a germ plasm factor of precox significance.

On the other hand, there is the widest departure from Kraepelinian standards in the direction of dynamic interpretations as perhaps best exemplified by Kempf.(1) Most of the dynamic interpretations, however, the psychoanalysts in particular, retain the Kraepelinian captions as the most practical set of symbols. Between these two extremes there are all sorts of efforts, but the general tendencies indicate clearly a growing dissatisfaction with older static formulations and an increasing effort in the direction of a truly interpretative psychiatry.

From the point of view of the situation as I have thus stated it I will call your attention to certain indications of these existing tendencies and to certain recent developments and correlations. My

comments will necessarily be somewhat scattering and disconnected. I shall try to pick out of the mass of material of the last about three years particular things which I think to have significance in one way or another. First, to follow on what I have just been saying about heredity, I cannot pass without calling attention to the work of Kretschmer(4) in his study of sensitive ideas of reference, not so much to commend it, but for the purpose of calling attention to the general undercurrent of dissatisfaction with the old formulations which finds expression in all sorts of new efforts, and I believe that even when these new efforts may be properly severely criticized, and for that matter discarded as representing no useful advance in themselves, still they represent a spirit of unrest which has a forward direction, and which, from this point of view, is a highly significant and important indication of what is going on in psychiatric thought today. I was minded particularly to speak of Kretschmer's work because there seems to be a basis, perhaps a slight one, for correlating it with results of certain biological experiments. Kretschmer believes that he has been able to group together a series of symptoms which he refers to as sensitive ideas of reference, and sees in that group sufficient coherence to warrant his believing that it has a fairly definite hereditary basis. In a recent conversation with Davenport, who is conducting experiments on the transmissibility of cancer in rats, he told me that it had been possible to develop two definite strains of rats, one of which was sensitive to the carcinoma cells, and when they were implanted developed a tumor, and the other of which was not sensitive, and when carcinoma tissue was implanted in this strain no growth followed. In other words, the hereditary factor in carcinoma is not, so to speak, in the carcinoma itself, but in the sensitiveness to certain kinds of noxae, let us say, which makes it possible for an animal to develop carcinoma. We have a similar sort of reasoning in Kretschmer's work, or at least we can indulge in it if he does not, and we may ask ourselves whether in certain paranoid conditions there may not be a hereditary factor consisting of sensitiveness. I am aware that this is only calling old things by new names, and only a new naming of the old familiar predisposition. Even giving a thing a new name is not without its possible value, for when we come at an old concept newly labeled the new label is bound to appeal to a somewhat different apperceptive mass, and that means that the old concept must of necessity take on new meanings. But then predisposition is no longer a useful concept, and in the light of the present confusion regarding what is and what is not hereditary, it seems to me quite worth while that analyses should be pushed into these unknown territories, and that what before was considered as an undifferentiated unit,—I refer to predisposition,—should now be broken up into various parts and the history of each part traced and its relations established. This may or may not be

productive of results in this particular instance, but at least it is thinking about the problem rather than resting in a static formulation, and this precisely is the tendency of modern psychiatry, even though Kretschmer's work itself, standing alone, might hardly indicate it.

There are a number of other recent efforts in psychiatry that illustrate more or less the same principle, efforts which in themselves are frequently intellectualistic in type, and yet when looked at in their setting, and I mean by their setting the whole movement of modern psychiatry, they can be seen to be bits which have been thrown to the surface by the underlying dynamic urge. Such a formulation is that of Schilder,(5) in his study of the psychology of mania, who looks upon mania as a reaction to unpleasant experiences, the purpose of which is to overcome painful emotions, thus constituting a defense reaction which has also the purpose of rendering the individual capable of new undertakings. This combination of pleasure and action the author speaks of as a "manic fluidum," which fluidum is stored in a reservoir from which it may be released on occasion. This is distinctly Spencerian, but the author really does make an effort at dynamic formulations, and his manic fluidum should only have the value of a figure of speech. He discusses the question of change of level, but thinks these changes of level are due to extra-psychic factors rather than to an unconscious. He very definitely also rejects the idea that functions can be thought of in a static and soulless mosaic.

Leaving this aspect of the question, let us return to the matter of heredity, and here I would call to your attention particularly the efforts that have been made in several directions to hitch up traits of character, or, as they might be called, types of action pattern systems in the personality make-up, with definite types of bodily configuration. During the war the French brought out what appeared to be, at least for the practical purposes of military classification, a very suggestive differentiation into digestive, respiratory, muscular, and nervous types. More recently Kretschmer(6) has contributed a very suggestive study along these same lines, developing three bodily types, the asthenic, the athletic, and the pyknic. The asthenic and the athletic types tend to develop the schizophrenic types of psychoses, while the pyknic types tend to develop the cyclothymic reactions. Here the effort is distinctly to hitch up body types with psychotic reactions. This whole tendency is especially interesting, and perhaps has its greatest possibilities in connection with the development of our information about the endocrine glands, particularly those which control growth.

Most closely allied with this effort to correlate character traits with bodily structure have been the efforts to define more accurately the basic factors of character make-up itself after the manner which

has been made familiar by the work of the psychoanalytic school. I am thinking more particularly of such work as that of Forsyth,(7) who has endeavored to trace the psychological simples of the infant mind in their unfoldings, complex interrelations, and disguised manifestations in the adult character. Then there are the efforts to define character types, to group the various psychological traits which hang together, to define the mechanistic basis for such groupings, and to attempt broadly to outline the life histories of such types, to define their possibilities, their limitations, and to indicate their main tendencies. Jung's work along these lines has been long known; I would mention his recently published book on psychological types,(8) which is a more detailed presentation and further elaboration of his views. Hinkle(9) has given us a similar presentation, which, though less extensive, is extremely interesting and full of valuable suggestions.

It will be noted that three distinct types of effort are in evidence. First, the effort to correlate character make-up with bodily make-up. Second, the effort to define character make-up itself; and third, the effort to correlate types of character make-up with types of mental disease.

Perhaps the most significant effort in the way of new formulations covering pretty generally the field of psychopathology is that of Birnbaum.(10) Birnbaum sees in the previous method of approach an effort "at seizing of the complete disease picture," and contrasts this method with that of "structure analysis" as the coming principle for research. The syndrome of the psychosis in its outward manifestation is often the product of a complex, many sided and varying coöperation of factors of different nature, endogenous and exogenous, mental and physical, functional and organic, which makes necessary what Kretschmer recently calls a "multidimensional diagnosis." Birnbaum speaks of the superstructure of the disease, which includes the components represented by the symptoms and course, the accessory conditions in which the disease arises, the processes from which it springs, and the factors by which it is conditioned. The cause and the form of the disease he would separate as the pathogenic and the pathoplastic phenomena respectively. With these factors are associated the general liability or predisposition (pathogenic tendency) or the tendency to a certain form of disease (pathoplastic tendency). The factors which set the disease in motion are the provocative factors. The task of future psychiatry is to set forth these various components, and their different influences in the disease picture. Birnbaum distinguishes endogenic, exogenic and psychogenic factors. The simplest cases may be composed of determinants of different character value, and the pathogenic and pathoplastic valency and the relations that these factors bear to each other are of great significance. For example, a disease picture may be

conditioned pathoplastically, that is, the pathoplastic phenomena may obscure the true disease type, especially when condensation, transformation, symbolization, conversion, etc., are taken into account. As to prognosis, structural analysis diminishes the faith placed in the course of the disease by showing that the periodic course need not always be conditioned pathogenically, but may be caused pathoplastically. Further, the new point of view shakes the dogma hitherto held concerning the prognosis, namely, that is unalterably associated with the type of disease. The pathoplastic moment may be important for the prognosis. Kronfeld,(11) in his comments on Birnbaum's views, says that a disease entity can only be considered to exist where a systematic uniformity in a whole series of interrelated manifestations can be proved. Clinicians must proceed from external phenomena to the inner laws upon which they depend. Modern clinical efforts are in the direction of a general dynamic point of view extending beyond the pure method of ontological description. This is certainly thinking in the right direction.

As might be expected, the new direction cannot get away with it quite without criticism, and Stransky,(12) in discussing the whole problem of the new direction of psychopathology, supplies this criticism. He sees in this "new direction" a purely speculative philosophy with no concrete empirical grasp upon reality. It is an irrational, absurd "desk mythology." He is willing to let the philosopher alone so long as he keeps within the field of metaphysics, but when he invades the field of psychopathology Stransky would cry "Hands off!" Stransky's real bone of contention is that too much psychiatry is getting away from the patient, and he strikes a very healthy note of warning when he speaks for a closer alliance of our thinking with our actual clinical contacts. And while I am on this point let me pay tribute to American psychiatry and to our late distinguished colleague and friend, Dr. Hoch, whose death has been so material a loss to psychiatry in this country, and not only to psychiatry, but to psychiatrists, because his relation with all of us was so closely personal. I refer to his work on Benign Stupors,(13) which was brought out posthumously as a result of the labors of another one of our members, Dr. MacCurdy, to whom we all owe a debt of gratitude for the very excellent and painstaking completion of what must have been an extremely difficult task. This work of Hoch shows very clearly how the speculative side of psychiatry, of which Stransky complains, and the clinical side can be brought into fruitful relations. Kraepelin, it has always seemed to me, could properly be said to have brought descriptive psychiatry to the highest point of excellence and progress in this direction beyond Kraepelin would be merely a matter of working out minor details. If, however, we turn to Kraepelin's descriptions of the psychoses, we find there an enormous mass of symptoms brought together under various

headings, but almost altogether as separate and distinct affairs out of relation with any particular patient who may have manifested them. It is a method with which we are familiar. The fever curve of typhoid fever is discussed entirely apart from any particular patient, the variations which it may show are recorded and charted as a separate entity. Hoch was one of the first psychiatrists in this country to appreciate that this method of dealing with the symptoms had taken us as far as we could go, and that from now on the development of psychiatry would have much more to say about the human problem involved in each particular patient and that symptoms would have to be considered, if they were to be deeply understood, in their settings, a term with which I know you are all quite familiar. In his "Benign Stupors" Hoch has kept close to the clinical facts, but he has not been afraid to look at those clinical facts from the point of view of the theorizers, the speculators, or what not, against whom Stransky has hurled his criticisms. With the microscope of the analytic school Hoch has found things in his patients which he never could have found had he used only the naked-eye vision, such as that developed in Munich.

Leaving these more general matters, let me call attention to a few more concrete, specific instances of accomplishment in various fields. First, I would mention Mott's(14) study of the testes of precox cases, in which he demonstrated a complete arrest of spermatogenesis and a more or less regressive atrophy. These findings are significant in view of the deficient potency of so many of these patients—a clinical fact with which I have no doubt you are all familiar, and which indicates to my mind that the precox individual may really be considered as essentially defective, at least in the psychosexual field. This is interesting in connection, for example, with the observations of Fay.(15) His schizophrenics, who were introverted without projecting their impulses, were sub-myxoedematous, while he found hyperthyroids as a whole inclined to be extroverted and to keep in closer contact with reality than other types. We are reminded by such observations of Kraepelin's early indictment of the thyroids and gonads in precox. These findings of Mott are in line with what has been found by other investigators; for example, Hauck (16) has found among precoxes general infantilism relatively frequent, and genital infantilism in female patients, especially in association with the catatonic form, while Lewis has found, at St. Elizabeth's Hospital, marked aplasia of the circulatory system manifested by very small hearts and aortic arches.

Another recent research is that of von Monakow(17) and Kitabayashi (18) on the choroid plexuses in precox. They believe that they play a considerable function in this group of cases. Aside from their function of secreting cerebrospinal fluid, they believe they act as selective filters for the products of metabolism and

endocrine secretions. Their function, therefore, is to neutralize, detoxicate, or transmit the products of internal secretion so far as they have to do with brain functions. Emotional upsets, the maintenance of strong passions for long periods, attendant as they are by excess productions of the glandular secretions, make heavy demands upon the plexuses. In all of the twelve cases examined degeneration was found. They believe that in all similar conditions diseased conditions of the plexuses will be found, and that all higher mental processes are the product of the continuous coöperation of the glandular and central nervous systems, particularly the cortex. Morowoka, (19) working in Mott's laboratory, contradicts these findings, at least so far as they refer to dementia precox.

In the toxic-infectious group of psychoses the largest literature has been supplied by lethargic encephalitis. You will remember that Kraepelin, in years past, endeavored to discover whether there might not exist in the various toxemias and infections a specific type of reaction at the psychological level, whether, for example, there might not be a difference between the mental picture of the delirium of pneumonia and of typhoid fever. In spite of the fact that alcohol, on the one hand, particularly in the Korsakoff syndrome, and syphilis, on the other hand, as paresis, did give us a certain symptomatology which was sufficiently characteristic to warrant the hypothesis of psychological specificity, still on the whole Kraepelin's efforts have been futile, and it has come to be believed that the symptomatological gamut of the disintegrating neuron was relatively short, that it was characterized more especially by delirium or deliriod reactions or confusion, and that it made no difference what the causative factor might be which tore down the structure of the neuron, the symptoms were the result of this disintegration of structure and not of the forces which produced it. From two directions I seem to see that this position can no longer be satisfactorily maintained, and that perhaps we shall have again to acknowledge the wonderful prevision of Kraepelin. In the first place, the generic type of symptom, such as delirium due to toxic or infectious factors, has been increased in number. We not only have delirium, deliriod reactions and confusions, but affect and mood disorders, schizoid reactions, convulsive reactions, Korsakoff-like reactions, paranoid trends, but more recently, and this is the particular thing I have in mind, a new symptom complex has been described, which belongs in this category of, so to speak, generalized symptoms, namely, the symptom of distressed perplexity, described by Hoch and Kirby. (20) The other direction which I mention is that pointed by the symptomatology of lethargic encephalitis. There are indications that the qualitative specificity of the psychic symptoms is greater in this disease than for the general run of toxic and infectious states, and perhaps as great as for the analogous infectious organic disease, paresis. I would call your

attention particularly to the psychological reactions found in this disease by Hohman, (21) particularly such reactions as (a) push of talk without distortion, (b) surprising alertness on arousal from stupor, and I would add the lethargy itself.

Perhaps the epidemics of influenza and encephalitis in recent years have served to materially aid in bringing about a rapprochement between neurology and psychiatry which in the past have been entirely too independent, not to say condescending, of each other. There have been a number of studies appearing in the literature lately which indicate that the two disciplines are gradually drawing closer together. I will mention only one, the paper by Fränkel (22) on the psychiatric significance of disease of the subcortical ganglia and its relation to catatonia. He calls attention to the long estrangement of neurology and psychiatry, but indicates how they have been coming together of late years in the consideration of the aphasia and apraxia problems and frontal tumors. He now comes forward with a considerable group of neurological conditions involving the basal ganglia, particularly the striatum, which have associated with them mental symptoms. This group includes pseudosclerosis, Wilson's disease, athétose, torsion spasm, strangulation, carbon monoxide poisoning, and catatonia. He no longer looks to the cortex alone for the explanation of mental involvement, but believes that alterations of the psychic life may be the direct result of disease at the basal ganglia level. Most of the disturbances at this level seem to have a large motility component, and it is not difficult to see how any profound interference with the machinery of expression might show at the symbolic level. I have on several occasions called attention to the value of certain work, particularly Kempf's from this point of view, namely, its ability, because of a common terminology, if nothing more, to bring the organicist and the functionalist together on common ground.

In the field of the epilepsies I would call your attention to Bolten's (23) article on epilepsy and tetany, in which he discusses the influence of the thyroid and parathyroid glands upon the development of convulsive disorders, but more particularly to Curschmann's (24) criticism of Bolten, wherein he takes the occasion especially to comment on the whole subject of calcium metabolism, not only in relation to tetany, but in relation to epilepsy. The deprivation of calcium, as a result of faulty control of its metabolism, resulting in an increased sensitiveness of the cortex and epileptic and spasmophilic responses as a result.

At the psychological level Clark's (25) observations on the nature of the disturbances of consciousness in the epileptic fit deserve mention. The nature of this disturbance is a gradual retraction of the field of object consciousness with a corresponding intensification of subject consciousness. This description is on all fours with the

description of the state of mind of the soldier by Bird(26) in his study of the psychological changes that took place from the time the soldier left home to the time that he went over the top. He reached quite the same sort of conclusion, namely, that there was a gradual falling away of objective interests with a corresponding intensification of interest in self, until at the moment of charge the external world had been practically contracted to a pin-point, as it were. And, finally, there is to be noted the increased acceptance of the idea that essential epilepsy is a total life reaction.

With regard to that exceedingly obscure region, the involution period and the presenium, there has been quite a considerable literature. The problems involved here are exceedingly complex, but their nature and their relations are beginning to be better appreciated and the process of the dismemberment of the psychoses in this chronological period has begun. Without undertaking to discuss the problems that are presented by this group of psychoses, I will pass over this period with simply giving a few names of syndromes which have been described and which will be in themselves sufficient to indicate somewhat of the nature of the efforts which are being made for the dismemberment of the psychoses of this region. There is the involution paranoia of Kleist,(27) the involution paraphrenia of Serko,(28) the presenile paraphrenia of Albrecht,(29) and the paranoid psychoses of advanced years of Seelert.(30)

In the field of psychoanalysis I would particularly call attention to the growing importance of narcissism and to the studies which have recently been made of the narcissistic psychoses, and the appreciation that much of the difficulties which have been encountered heretofore in the more malignant types of neuroses and psychoses have been due to narcissistic fixations. The important point is that the self-interest becomes emotionally loaded and that the emotional load contains a libidinous component, and therefore the self becomes the love object. Particularly the paraphrenias have been approached from this viewpoint, and it is perhaps worth noting in passing that the psychoanalysts show a tendency to use the term paraphrenia for the entire precox group rather than limiting it, as Kraepelin has, to the paranoid types.

Freud(31) has also studied the melancholias from this narcissistic viewpoint, and believes that the mechanism is a withdrawal of the libido from its object, but that instead of transferring it to a new object, as in the normal mechanism, or introverting it on to unconscious phantasies, as does the neurotic, or applying it to the ego, as the paraphrenic does, the melancholic replaces it by a narcissistic identification of self with the former object. The libido is withdrawn from the object and the object is built up within the ego itself; that is, it is, so to speak, projected upon the ego, or I should prefer to say, it is introjected. The explanation of this mechanism is that

it probably represents a regression to the original narcissistic way in which the patient fell in love. The ego thus becomes split, and one part to which consciousness adheres can thus criticize, hate and abuse the other part formed by a fusion with the idea of the object. In other words, one part of the ego can treat the other part as object. Thus suicide becomes understandable as an attack upon that aspect of the ego that is identified with the object, both loved and hated (ambivalence). In this connection I would mention also Ferenczi's(32) very stimulating and suggestive paper on tics, in which he considers this hitherto puzzling group of rather ill-defined motor manifestations from the point of view of narcissism and suggests some very interesting correlations with other motor syndromes, such as the stereotypics, mannerisms, and catatonia.

Another notable contribution in the psychoanalytic field is that of Ferenczi's(33) so-called "active therapy," to which Freud(34) has given his adherence. Briefly stated, active therapy implies that the patient during the analysis should, relatively speaking, remain continent. This does not mean continence in the usual sense of the term, that is, sexual continence, but abstinence from sources of satisfaction which are substitutes for the repressed desires, and which therefore constantly relieves the tension of repression, making the patient more comfortable and correspondingly decreasing or lessening his desire to be relieved from suffering. Continence is advocated in order that all of the energies of the individual which are capable of being utilized to effect a cure shall be focused to that end rather than be drained in the course of the analysis in various substitutive activities. This is a move in the direction of a more active interference on the part of the analyst than has heretofore been the rule.

I cannot close this review without reference to certain developments in allied and closely related fields. I refer particularly to the fields of neuropathology, neuroanatomy, and neurophysiology. In the first of these fields, namely, that of neuropathology, Brouwer's(35) work on the significance of phylogenetic and ontogenetic studies for the neuropathologist is an exceedingly stimulating study, and shows very well how certain symptoms of which we have had no adequate understanding in the past may receive their explanation when the nervous system is studied not only from the topographical point of view, but from the historical, the developmental and the functional point of view, and I would emphasize that I mean by functional not the topography of function, but function in its broader sense, as an aspect of an integrated whole, not only in its spatial but in its temporal relationships.

In the field of neuroanatomy I would mention particularly Kappers'(36) work on neurobiotaxis and Child's(37) exceedingly stimulating little book on the origin and development of the nervous

system from a physiological viewpoint. Perhaps of most importance, however, in this whole field of neuroanatomy, is the magnificent and exhaustive work of the Dutch anatomist, Winkler, (38) who designates his great anatomy of the nervous system as an effort at a grouping of the tracts and the centers of the nervous system, by which the various sensory impressions can be translated into reflex reactions, into a physiological *ensemble*. This surely is a long way from the old-fashioned topographical anatomy.

In the field of neurophysiology I think the work of Hunt (39) on the double innervation of the voluntary musculature is of great importance in helping us to understand and to interpret the mechanism of emotional expression.

And as correlating these fields of neuropathology, neuroanatomy, and neurophysiology, I may close by mentioning the work of Groddeck (40) and Jelliffe (41) in their efforts to determine the symptoms at the psychological level of chronic organic disease, and the deeper significance which has thus been given to what has been known as archaic symbolism, with the possibilities which a real understanding of the true significance of this type of symbolism may have for future developments along these lines. I have attempted to formulate my understanding of archaic symbolisms in a halting and, I recognize, a very unsatisfactory way in my *Foundations of Psychiatry*. (42)

And finally I would emphasize a point of view which I believe to be of prime importance, and to which I have devoted a chapter in my *Foundations*, namely, the point of view that psychopathology must more and more recognize man as a social animal, and that the psychoses cannot be fully understood except as it is recognized that they are disturbances of man as a member of the herd, or, as I have formulated it, the field of psychopathology is at the individual-society level. Only by an understanding of what is implied by this formulation can we proceed safely along the many ways that recent sociological efforts are opening up. This practical development along social lines is one of the most important of all the trends of the day in our field, but it has such wide and varied significance that I do not feel it possible to more than mention it in an address of this sort. It deserves a special treatment.

A legitimate proof of the value of any new way of thinking in any particular field of human endeavor is the evidence that can be brought that that same way of thinking is growing up simultaneously in other fields. I have already intimated that such proof could be brought, but if you ask me to point the evidence I will suggest that you read Elie Faure's *History of Art*. (43) Here you will find art treated, not as a series of chronologically grouped products, but as a living whole, pulsing with the life of the peoples and as their expression of that life's meanings. As another example, I come to a

system of formulations that have, during all time, been looked upon as the essence of finality. I refer to mathematics. Now comes relativity(44) and the stronghold of all the certainties is shaken.

Such examples as these give most stimulating glimpses of possibilities that are being opened up to us through these new pathways that the mind is making for itself, transcending its old limitations and recreating itself. To the chosen few this is nothing new, but in an age when still the majority of those who contact at first hand with the mental case not only think in terms of "insanity," "incoherence," "craziness," and the like, but when some writers even decry any effort at reading meaning into the symptoms—Küppers (45) says that instead of trying to find meaning for this meaningless behavior the same meaningless factors should be sought for in normal life—it needs a mighty propaganda. Thus does the field of psychopathology invite us, offering us premiums far greater than ever before. Not only are there facts to be discovered, but because of the advance in general science in all directions, these facts have much broader possibilities for correlation than ever before, and then because of the new way of thinking about facts their significance will be much more profound.

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THE PRECIPITIN TEST OF THE ARACHNOID FLUID

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AND

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No serologic change of the arachnoid fluid is recognized so early or constantly as an increase of the protein content. Protein reactions of pathological fluids generally remain positive long after other tests have become negative(1). Thus, the Pandy(2) and Ross-Jones(3) reactions are the last to disappear in poliomyelitis and in successfully treated syphilis of the central nervous system. It is, therefore, apparent why so many attempts have been made to substitute accurate quantitative reactions for the qualitative and subjectively quantitative tests now in use. Many such endeavors have not proven successful because the tests were either no more accurate than the older methods or more troublesome.

It occurred to us that specific antiserum containing precipitins for the proteins or the protein fractions, the albumins and globulins of arachnoid fluid, might be found to give an accurate, speedy and easy quantitative reaction. In a preliminary report(4) of our results with specific precipitin tests of arachnoid fluid, we pointed out that the fluid of general paresis shows an increase of both albumins and globulins, mainly, however, of globulins when tested by this method. We now wish to give a more detailed report based on further work with arachnoid fluid from a variety of sources.

The method of preparing the antisera is simple. Rabbits are injected intravenously at four-day intervals with increasing doses, say 2, 4, 6, and 8 c.c., of solutions of human serum albumin or serum globulin prepared in the usual manner. The albumin solution we employed contained .1415 gms., the globulin solution .0773 gms., coagulable protein nitrogen per 100 c.c. This approximates a one and a one half per cent solution, respectively, based on the results of Samuely(5) who estimates the nitrogen content of albumin at 15.93% and that of globulin at 15.88%. In our most recent tests we have used solutions of globulin prepared from weighed quan-

¹ From the Cook County Psychopathic Hospital and the John McCormick Institute for Infectious Diseases. Chicago, Ill.

tities of the dried substance. Antiserums may also be prepared by the intravenous injection of rabbits with arachnoid fluid, especially parietic fluid. The serums of the rabbits treated as outlined are titrated against human serum and albumin and globulin solutions, the titre given being the highest dilution of serum or solution in which the antiserum gives a definite precipitate by the contact or layer method after one hour at room temperature. Since some of the antigens used did not consist of a single pure protein, the antiserums naturally contained precipitins for both serum albumin and serum globulin. As a rule the rabbit serum gives its highest titers 7 to 10 days after the last injection.

Small tubes, 5 m.m. in diameter, are used in the test. A small amount of 0.9% salt solution is placed in each series of tubes by means of a capillary pipet marked at a definite height by a glass pencil. An equal amount of let us say arachnoid fluid is added to the first tube, thoroughly mixed, and one half of the mixture transferred to the second tube, one half of this mixture to the third tube, and so on until the last tube is reached. Thus, dilutions of from 2 up to as high as one wishes to go are obtained. Next a small amount of antiserum is placed under each dilution of arachnoid fluid by means of a capillary pipet, and the whole is allowed to stand at a room temperature for an hour. The plane of contact is then observed and the last dilution of the fluid is noted in which a white ring of precipitate has occurred. In this manner the test may be made with three or four drops of spinal fluid and a minimum amount of antiserum. It is, of course, essential that the fluid is not mixed with blood when drawn and that a cell count precedes the test. Fluids containing erythrocytes must not be used, since there is an admixture of serum albumin and serum globulin in such fluids.

A suitable rack for the small tubes may be made by drilling holes in a wooden block. A black background facilitates the observation of the white ring.

With this method a number of observations have been made on normal as well as pathological arachnoid fluids. The maximum reaction or upper limit for each antiserum is shown in Table 1. The arachnoid fluids employed were obtained from essentially normal persons and showed no pathological reactions towards the usual tests. Antiserum 538 reacts equally well with albumin and globulin solutions. Antiserum 541 reacts more with albumin than globulin, and the rest are antiglobulin serums reacting mainly with this solution. It is of interest to note that antiserums 546, 552 and 556, as

well as other antisera of similar titre, were obtained by injecting rabbits with paretic spinal fluid. The precipitin reactions of these sera show that the main increase of protein in paretic fluids is globulin.

Entirely different results are obtained when pathological fluids are tested with the same antisera. A few illustrative and characteristic results selected from each group or disease entity are given in Table 2. Many more fluids have been studied, but it seems unnecessary to give all the data, since the variations are slight. The routine tests, namely, Wassermann, Pandy, Ross-Jones, Noguchi, colloidal gold, gave typical results with the fluids examined. At a glance it is shown that the paretic fluids react in dilutions from two to eight times those of the normal maximum, and that this change is accentuated especially when antiserum obtained by injecting rabbits with paretic arachnoid fluid is used. (Antisera 546, 552.) In other words, paretic fluids react far more strongly with antiglobulin serum than with antialbumin serum.

Fluids of epileptics give almost opposite results. The more or less specific albumin antiserum 541 gave reactions in higher dilutions of the epileptic arachnoid fluids than of normal fluid. Many fluids of this group showed traces of protein with the Pandy reaction, a fact dwelt on previously (6) and it seems plausible to conclude that this trace of protein is due to a slight increase of albumin.

Tabes and the various forms of cerebrospinal syphilis usually give reactions higher than the normal maximum, and as a rule such fluids react better with antisera obtained by the intravenous injection of paretic arachnoid fluid. There is a tendency towards an increase of the globulin fraction in the fluids of tabes and other forms of cerebrospinal syphilis, though this is not as constant as in paretic fluids. Occasionally a fluid of cerebrospinal syphilis shows a normal titre, rarely, apparently, an increase of the albumin fraction. It is evident that these results depend somewhat on the stage of the disease and the particular type.

An increase of protein in the arachnoid fluid in epidemic poliomyelitis has often been demonstrated. This increase would seem to be caused by an increase of the albumin molecule. All cases of poliomyelitis observed were in the early stages, as shown by the day of illness on which the fluid was withdrawn. There seems to be a tendency for all acute inflammations of the meninges to produce a primary increase of albumin, while increased globulin is more suggestive of a chronic process. We have already demonstrated that

many psychoses give normal precipitin reactions of the arachnoid fluid(6). Our complete findings embrace about 75 fluids, 25 from the dementia praecox group. We have selected cases which are typical. The same facts apply to alcoholic conditions. The last group of arachnoid fluids were withdrawn from patients with various neurological conditions. Some of the fluids of chronic inflammatory processes or chronic degenerations react in high dilutions. These abnormalities are best demonstrated by antiglobulin serums.

Summing up the results, we would state that the work must be continued and applied to a greater variety of clinical cases than are at our disposition. However, we believe that we have demonstrated that the precipitin test is a simple and practical one, and that it can be applied with a minimum of experience, provided titrated anti-serums are furnished. For the present we shall be glad to furnish serums to those who desire to apply this method. Hardly any other equipment is needed. With this test and a cell count, it is possible to confirm a clinical diagnosis of general paresis. We believe the reaction to be more accurate than the colloidal gold test. It is far simpler. The antisera keep for some months in the icebox.

Furthermore, it has been shown beyond a doubt that the protein increase of parietic arachnoid fluid is due to an increase of globulin, and that in many epileptic archnoid fluids there is some increase in albumin.

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TABLE I

<i>Numbers of Antiserums</i>	538	541	546	547	552	566
Titre with human serum.....	3200	2000	100	800	3000	4000
Titre with albumin solution.....	512	2000	10	15	24	320
Titre with globulin solution.....	512	32	600	200	1500	640
<i>Arachnoid Fluids</i>						
1. Bronchial Asthma.....	8	2				
2. Chronic Arthritis.....	8	1				
3. Pyelocystitis	4	2				
4. Stab Wound.....	8	1				
5. Chronic Osteomyelitis.....	4	2				
6. Chronic Nephritis.....		16		8	16	
7. Oesophagal Obstruction.....	0			0	16	
8. Normal.....		8			32	

9. Normal.....			8	32	32
10. Normal.....			0	32	32
11. Normal.....			0	16	32
12. Normal.....			0	16	32
13. Normal.....		0	0	8	
14. Normal.....		0	0	8	
15. Normal.....		8	4	32	
16. Normal.....	8		8	32	
17. Normal.....		0	0	0	
<hr/>					
Maximum dilution of normal.....	8	16	0	8	32
Arachnoid fluid giving precipitate.....					

TABLE 2

<i>Numbers of Antiserums</i>	538	541	546	547	552	566
Titre with Human serum.....	3200	2000	100	800	3000	4000
Titre with albumin solution.....	512	2000	10	15	24	320
Titre with globulin solution.....	512	32	600	200	1500	640
Maximum normal reaction.....	8	16	0	8	32	32

Arachnoid Fluids

1. General Paresis.....	64	32				
2. General Paresis.....		16		16	64	
3. General Paresis.....		32		32	64	
4. General Paresis.....		64		32	256	
5. General Paresis.....		64	64			
6. Epilepsy.....	2	32				
7. Epilepsy.....	2	34				
8. Epilepsy.....	2	34				
9. Epilepsy.....	2	34				
10. Epilepsy.....	2	64				
11. Tabes.....		16		16	64	
12. Tabes.....		32		32	64	
13. Tabes.....		16		16	64	128
14. Cerebrospinal lues.....		16		0	64	
15. Cerebrospinal lues (meningitis).....		32		32	64	
16. Epidemic Poliomyelitis (2nd day).....	4	32				
17. Epidemic Poliomyelitis (3rd day).....	4	16				
18. Epidemic Poliomyelitis (5th day).....	8	64				
19. Epidemic Poliomyelitis (9th day).....	2	64				
20. Epidemic Poliomyelitis (11th day).....	8	16				
21. Dementia Praecox.....		8		8	16	
22. Dementia Praecox.....		4		4	8	
23. Dementia Praecox.....		16		4	8	
24. Dementia Praecox.....		8		8	16	
25. Dementia Praecox.....		4		0	8	
26. Chronic Alcoholism.....		4		4	16	
27. Chronic Alcoholism.....		4		4	16	
28. Chronic Alcoholism.....		4		4	4	
29. Alcoholic Psychosis.....		0		0	16	
30. Cerebral Thrombosis.....		32		16	128	
31. Multiple Sclerosis.....		0		0	32	
32. Amyotrophic Lat. Sclerosis.....		16		0	64	
33. Prog. Musc. Atrophy.....		0		0	16	
34. Prim. Optic Atrophy.....		0		0	32	

THE CHOROID PLEXUSES IN ORGANIC DISEASE OF THE BRAIN AND IN SCHIZOPHRENIA*

BY SIDANICHI KITABAYASHI

(CRITICAL REVIEW BY DR. MINKOWSKI, ZÜRICH)

The study of the choroid plexuses, their relations to the cerebrospinal fluid of the ventricles, the ependymal canal of the spine and the subarachnoidal spaces has been too long neglected by neurologists.

Very interesting researches have nevertheless been carried out during the last twenty years, which have led to more and more importance being attributed to them from the point of view of the physiology and pathology of the nervous system. Thus it is that Pettit and Girard, in consequence of their experiments, come to the conclusion that ependymal cells lining the lateral ventricle exercise a secretory function and they look upon the *choroid plexuses as glands with external secretion whose destination, however, is internal*, conclusions which are more or less confirmed by the researches of Mott and Halliburton, Capellerri, Cavazzini, Reichmann, Meeks and others. Cathelin gives a general view of the whole *circulation of the cerebrospinal fluid* and insists on its independence of the circulation of the blood.

Quincke, Sicard, Flatau, Lewandowsky and others have made subarachnoidal injections and have studied the direction followed by the injected masses. Schläfer and Goldmann obtained important experimental results which prove that the different staining substances (methylene blue, trypan blue, etc.), when injected into the blood, are arrested by the *choroid plexuses, which act as barriers or filters of the cerebrospinal fluid and the nerve parenchyma*, protecting the latter from harmful substances, whilst these same staining substances injected directly into the sub-arachnoidal spaces enter unimpeded into the medullary or cerebral parenchyma and exercise a noxious effect upon the animal.

Many other researches have more or less recently been carried out as to the chemistry, the cytology and the bacteriology of the

* V. Monakow. Biologie und Psychiatrie. Schweizer. Archiv für Neurologie und Psychiatrie, vol. IV, fasc. 1 u. 2, 1919.

V. Monakow und Kitabayashi. Schizophrenie und Plexus choroidei ibidem, vol. IV, fasc. 2, 1919.

cerebrospinal fluid in its normal as well as in its pathological condition (Widal, Sicard, Mestrezat, Oirksen, Rotsky, Capka, Nonne, etc.). These results, combined with considerations drawn from the embryology of the neuraxis, which indicates a very early development of the choroid plexuses, preceding even that of the blood vessels, have led v. Monakow to his conclusions: He attributes to the choroid plexuses, in collaboration with other organs of internal secretion (the suprarenal, thyroid, the epithelial corpuscles, the sexual glands, the hypophysis, epiphysis cerebri, the neuroglia), *a bio-chemical position of primary importance in the development, the integrity and the normal action of the nervous system.* In the first place, the plexuses are in intimate functional relationship with the parts of the brain in whose neighborhood these glands are situated; that is to say, the bulb, the tuberculum acusticum, the optic layer, the central grey substance, etc., all of them in more or less close relationship with the sympathetic (or parasympathetic) system, and serving as a basis for the emotional element in the nervous processes.

According to v. Monakow, the *purifying and protective action of the choroid plexuses* is important more especially in the case of psychic or emotional events disturbing the instinctive life processes, and thus bringing about derangements in the internal secretions, (increase of adrenalin and of other substances in the blood); the plexuses protect the neuraxis from such neurotoxic substances either by barring their way into the nervous parenchyma by way of the ventricular ependyma, the perivascular sheaths, the neuroglia, etc., or else by neutralizing or at least weakening their toxic character.

Following up this line of thought, Monakow asks himself if mental diseases, particularly those characterized by more or less profound emotional disturbances, such as schizophrenia, or to a less degree the different neuroses, such as hysteria, psychasthenia, etc., may not be due to disturbances of the choroid plexuses, the ventricular ependyma and the neuroglia (all of them engaged in internal secretion according to the Spanish school, Ramon y Cajal, Achucarro), disturbances brought about either by repeated and serious injuries or by a primordial reduction of their physiological value—that is, of their natural constitution.

In order to answer these questions, Kitabayashi, one of v. Monakow's students, has studied the plexuses and the neighboring parts of the brain of sufferers from schizophrenia (dementia praecox), on material principally furnished for the purpose by the Institute of

Cerebral Anatomy (Burghölzli, Cantonal Asylum in Zürich), supplemented by control material. The whole was divided into three groups of cases: (1) Persons of different ages (eleven months to fifty-five years), mentally normal, having died of acute or chronic disease (appendicitis, pneumonia, tuberculosis, etc.)—five cases. (2) Patients having suffered from different chronic illnesses of the nervous system, diffused or localized, subdivided into two groups: (a) Patients without delirious symptoms (hallucinations, obsessions)—one case of general paralysis, one case of cerebral tumor, one of hydrocephalus. (b) Non-schizophrenic patients, having presented pronounced delirious symptoms—one case of circular psychosis, one of deaf-mutism and endemic idiocy, one of chronic alcoholism. (3) Eight cases of schizophrenia belonging to different forms of *dementia praecox* (hebephrenia, catatonia, paranoid), having presented during periods of from three to twenty years symptoms characteristic of that illness (hallucinations, obsessions, stereotypies, negativism, etc.), and having died at various ages between twenty-five and forty-eight years, one case having reached fifty-nine years.

In all the cases examined the choroid plexuses and adjacent parts of the brain were excised, fixed in formol, embedded in colloidine, cut into series and stained either with hematoxyline-eosine, carmine, toluidine blue (Nissl), or according to the method of van Gieson.

The examination of the plexuses was carried out in the first place on those of the fourth ventricle and the lateral ventricles; in the second place, on those of the third ventricle. In all the cases of *dementia praecox* examined (third group) the choroid plexuses presented a more or less *uniform* anatomopathological picture. In all cases there was found an *atrophy "en masse" of the whole of the ectodermic cells* lining the villosities of the plexuses; some of the cells were simply atrophied, others sclerosed, vacuolized, liquefied, degenerated, the nuclei also profoundly altered, displaced, deformed, or completely degenerated. Entire groups of cells were often found to have desquamated, so that the subjacent mesoderm was denuded. The mesodermic interstitial substance, as well as that of the vascular and capillary walls, was sometimes found in a state of proliferation; at other times it was atrophied; it often contained cysts.

In the lumen of the ventricle, between the villosities, in all cases exudations were found, rich in cells, full of corpuscles, probably albuminoid or amyloid, as well as decomposed blood globules and pigments.

Another important and interesting fact is that *the ependymal*

ventricle is often found either to be in a state of degeneration or to be entirely missing along a more or less considerable space. Under these circumstances masses of degenerated cell fragments, amyloid bodies, round or amorphous corpuscles (albuminoids), faintly colored and probably representing products of the disintegration of ependymal cells, nervous fibers and other elements having penetrated more or less deeply into the nervous parenchyma, are found in the ventricular wall and in the sub-ependymal tissue, more particularly in the neighborhood of the injured parts. In the case of a colleague who had hanged himself when he was thirty-five, after having suffered many years from a paranoid form of schizophrenia (depression, ideas of persecution, etc.), all these alterations were very pronounced, and considering the age of the patient, the absence of somatic complications and his sudden death were particularly striking.

Is this crowded anatomopathological picture pathognomic for schizophrenia? The study of the control brains (first and second groups) undertaken by Kitabayashi seems to prove that this is not the case as far as the character (apart from the degree and extent) of the changes which constitute the picture are concerned. Generally speaking, the choroid plexus is an extremely sensitive organ. It is really only found free of alterations in the newborn child; the child of ten years of age, and still more the normal adult, presents (at least from the mental point of view, first group) signs of regressive metamorphosis, evidently physiological, which increase with age; hyaloid degeneration of the glandular ependymal cells, desquamation of these cells, the presence of concretions and of corpuscles, and, above all, *proliferation of the conjunctive tissues.*

In cases of *chronic disease of the nervous system with absence of delirious symptoms* (second group), the same alterations are found, *proliferation of the mesodermal tissue* being their most characteristic feature, while the ectoderm of the plexus and the ventricular wall do not present very grave or extensive alterations. The cases, on the contrary, *which do not belong to the schizophrenic group, but which nevertheless present delirious symptoms* (hallucinations, obsessions, delirium, mental confusion, etc.), that is to say, profound disintegration of the mental life (second group), present *pronounced alterations of the ependymal parenchyma* of the plexuses, of the ventricular ependyma and of the sub-ependymal substance, *as well as of the interstitial and perivascular conjunctive tissue.* *The histopathological character of these alterations, as well as their localiza-*

tion, corresponds to those found in dementia praecox, and differs from them only in so far as their intensity is less, and above all in that they are less diffused.

Summing up all these results, the author comes to the conclusion that the following groups of pathological alterations are recognizable in the choroid plexuses: (1) Alterations having their origin in the interstitial and perivascular mesodermal tissue (proliferation, cystic degeneration, vascular processes, etc.), capable of bringing about secondary transformations of ependymal cells. (2) Chronic and acute alterations arising in the glandular ependymal tissue, causing primary destruction of the protoplasm, followed by that of the ependymal cells, and by sclerosis and atrophy *en masse* of complete groups of these cells. These alterations are generally accompanied by atrophic processes in the ventricular ependyma and the subependymal substance, and also by the penetration of pathological products into the nervous parenchyma. (3) Mixed mesodermic and ectodermic alterations.

The mesodermic type of alterations of the choroid plexuses is less noxious and may remain latent longer. It is nevertheless probable that if it goes beyond certain limits it may give rise to conditions of somnolence, stupor and mental confusion. On the other hand, the ectodermal (or mixed) type of alterations is more dangerous for the intimate physiology of the nervous processes. In cases where the advanced alterations of the glandular and ventricular ependyma are diffuse (particularly those in the fourth ventricle and in the inferior horn), they are accompanied by serious mental trouble, particularly affecting the emotional life, and by acute as well as chronic states of delirium by hallucinations, obsessions, negativism, etc.

Not one of the cases examined which presented such derangements, either among the cases of dementia praecox (group 3) or those representing other psychoses (group 2 b), was found to be without profound and diffuse alterations of the ependyma of the plexuses and of the ventricular wall, while in the mentally sound cases (group 1), or those with slight mental trouble (group 2 a, tumor of the brain, progressive paralysis, hydrocephalus), the ectoderm of the plexuses was much less profoundly affected, and that perhaps only secondarily and in consequence of primary alterations of the mesoderm.

These facts are very interesting and important. But what is the meaning to be attributed to them? In the case of schizophrenia have we to do with a primary disorder of the choroid plexuses, a

defective condition of the ependyma reaching back to a fetal period? Or is there a secondary lesion of the plexuses caused by a primary defect in the functioning of the glands of internal secretion (the suprarenal, thyroid, genital glands, etc.), which are also found to be affected in cases of dementia praecox (Mott, Kojima)? Or else, again, are the lesions of the choroid plexuses coördinated with those of the endocrine glands, and are they in both cases caused by as yet unknown endogenous or exogenous toxic influences whose manifestations are aggravated by the mental trouble? And again it may be asked, are the relations those of cause and effect, the relations that exist between lesions of the plexuses and the ventricular ependyma and the mental symptoms of dementia praecox and other psychoses accompanied by delirious conditions, or are they coexisting troubles due to a common origin, the plexuses being affected concomitantly with the cerebral cortex and the other nervous structures? These are all questions which at present are difficult to answer. It seems to be certain, nevertheless, that the alterations of the cortex in dementia praecox, studied by Alzheimer and others, are much less characteristic and of relatively less importance than those of the plexuses as described by Kitabayashi. This difference, as well as considerations of a more general order as to the part played by the plexuses and the cerebrospinal fluid in relation to the nervous parenchyma, lead us to suppose that in schizophrenia lesions of the plexuses may precede and at least partially determine those of the cerebral cortex.

However this may be, the author is right in considering that the chief value of his work consists in this: By his development of the ideas of v. Monakow he has attracted attention to the important and hitherto neglected question of the anatomy of the psychoses, and to the possible relations between the physiology and pathology of the choroid plexuses and the psychic symptoms in mental maladies.

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

STATED MEETING HELD MARCH 7, 1922, AT THE NEW YORK
ACADEMY OF MEDICINE, DR. FOSTER KENNEDY, PRESIDENT

A CASE OF PSEUDO-TUMOR, WITH AUTOPSY FINDINGS

DR. BEATRICE M. FAIRBANKS, CORNELL UNIVERSITY MEDICAL
COLLEGE (by invitation)

The patient, student, male, 21, family history negative. *Personal*: Instrumental delivery at term; usual diseases of childhood. In 1918 tonsillectomy for badly infected tonsils. *Present illness*: Onset February, 1921, headache, vomiting, dizziness, weakness. These attacks increased in the succeeding months, with transitory aphasia, numbness, excessive headache, some confusion and slight disturbance of consciousness; later diplopia appeared. In May, 1921, dropped to floor in attack. In July Dr. Kennedy noted nystagmus and right extensor plantar reflex. Dr. Ward Holden examined the eyes June 30, 1921, and noted bilateral papilledema and stated that the fields indicated pressure on the chiasm. At this time: rt. pupil 5 mm. slightly irregular, very sluggish to light; the left the same. There was slight divergence of eyes to near fixation. Crossed diplopia with red glass, with images very close together and equal distance apart, both in looking to right and left. No actual paralysis made out at present. Former attacks of diplopia lasted only thirty seconds. Vision, 20/40 right eye and 20/20 left. In each temporal field there was a long oval scotoma, extending from near fixation point to beyond the blind spot. Movement of fingers was seen in these areas, but a bilateral papilledema with many hemorrhages and patches of exudation. The top of each disc was plus four with retinæ zero. On July 18 Dr. Holden found the visual acuity the same. No nystagmus. Scotoma in each eye extended to within a few degrees of fixation point. On July 21st he noted no nystagmus; sustained clonus on right; not sustained on left. Power good, possibly left greater than right. Memory seems to be getting poorer. Does not remember events of the day before; no further aphasic symptoms. Diplopia about the same.

At this time radiographic study of the skull showed suggestion of intracranial pathology and displacement of the pineal gland downward. Spinal fluid not examined. Wassermann later reported negative. In July, Dr. Elsberg did a sub-temporal decompression;

nothing abnormal noted in the dura, but considerable sub-dural pressure. In August Dr. Kennedy noted deterioration of the fundi; patient drowsy; attention feeble. Later in August further decompression was done. A left hemiplegia developed. In October patient had become blind. He was treated with radium at the General Memorial Hospital. From this time patient suffered tremendous thirst, necessitating drinking several liters a day. There was great cranial herniation. Spinal drainage was done several times (eight in all). Five days before death acute oedema of the entire left side set in. One week before death transitory convulsion; great respiratory and cardiac difficulty. Final temperature was 107°. Patient was cheerful and optimistic, but very forgetful. He remained orientated till the last.

Pathological Findings: The brain was hardened in formalin whole. Externally there was a cavity into which it was possible to introduce the forefinger in the cortical region, corresponding to the right Island of Reil, with extensive roughening and laceration of the cortex in the vicinity, and extending upwards and forwards over the Rolandic area. On section the lesion was found to communicate with the posterior horn of the lateral ventricle, impinge slightly on the external border of the lenticular nucleus, and extend as far forward as the anterior horn, sloping outwards so that at its most anterior point it was only found in the plane of the cortex. Its vertical diameter was about two centimeters at its widest point.

The naked eye appearances are not those of a glioma with hemorrhage and necrosis, as we expected to find. It is always possible in these tumors, however rapid the degeneration has been, to find a zone of the familiar pearly color and gelatinous consistency between the necrotic area and the normal tissue. On the other hand, although the brain substance is normal in color and consistency, the edges are ragged to a degree incompatible with a porencephaly or a congenital hydrocephalus, where the convolutions usually dip smoothly down into the cavity. There is no evidence of a cyst wall, which is a perfectly definite structure microscopically, and no indications of abscess. Neither did the naked eye appearances suggest a gumma which is usually surrounded by a distinctly hyperemic zone.

Microscopically, we examined sections from blocks taken from all points of the circumference. Professor Ewing was good enough to go over them very thoroughly and confirm my opinion that there was no tumor present. Alzheimer's stain for glioma gave me no help, and Haidenhein's iron alum and ordinary hematoxylin gave the most useful results. The sections all show a slight increase in the number of large cells of undoubtedly glial origin. The small ones appear to be lymphocytes. Were they small glial cells of the type frequently found in the so-called glial sarcoma, we should expect to find transition types between them and the large cells, which are not present. There is a thickening and a slight increase in the cells of the subpial glia, a proliferation of the small vessels and a thickening of the large ones, and a general very perivascular

infiltration, all more suggestive of a chronic inflammatory condition than a neoplasm, particularly a gliomatous one, where the vessels are liable to be thin-walled and easily ruptured. There are no compound granular corpuscles.

I think we can rule out tumor. There remain lethargic encephalitis, syphilis and pseudosclerosis. The sections nowhere display the typical cuffing of the arteries which would be inevitable in a case of encephalitis of such long standing. Against syphilis we have the negative Wassermann and the social history of the case. In favor of the diagnosis there are the pathological appearances which suggest a very early stage, not more than secondary, which might fail to give the reaction, and the clinical history, points of which, such as the recurring diplopia, are rather suggestive of syphilitic disease. I sent the sections and the history to Dr. Greenfield, pathologist at the National Hospital, London. Although unable to make a diagnosis, he thought the lesions most probably syphilitic in origin. As to pseudosclerosis, the rapidity and course of the disease in this case are entirely opposed to what we know of this pathological process. On the other hand, we know almost nothing of the factors controlling it, except in Wilson's disease, where the *fons et origino mali* would appear to be the liver, and there is now no evidence that a similar process might not represent the reactions to some other primary infection. If so, it probably began in the Island of Reil.

Microscopically, the very abrupt transition between the normal tissue and the cavity, the type of large cells, and the perivascular gliosis are reminiscent of the description Wilson gave of those cases of lenticular degeneration which he personally examined. I think the process must have been a slow one, owing to the extreme passivity of the tissues surrounding the cavity, possibly supervening on some slight congenital defect, and that the tumor symptoms are largely referable to the hydrocephalus resulting when the cavity extended into the ventricle.

Discussion: Dr. Smith Ely Jelliffe said: It would be presumptuous to hazard a suggestion at this time as to the diagnosis. I think there will be more to say when serial sections are made. These may show foci where a serous exudate has pushed through and destroyed the tissues in other portions of the brain.

Dr. Foster Kennedy said: I think perhaps the difficulty which Dr. Fairbanks finds may be due to the fact that radium had been very heavily used and this treatment may have destroyed typical cells. This has not perhaps been sufficiently taken into consideration.

Dr. Fairbanks (closing) said: I have not studied the effect of radium on the human brain. These results are not compatible with those I have seen in radiumized dogs. I do not think it would be possible for one type of cell to be so completely destroyed without affecting the others. I will, however, consult Professor Ewing in the matter, as he is more familiar with the subject than I am.

IS THE STOMACH A FOCUS OF INFECTION IN THE PSYCHOSES?

NICHOLAS KOPELOFF, PH.D., NEW YORK STATE PSYCHIATRIC INSTITUTE (by invitation)

[AUTHOR'S ABSTRACT]

The writer presented a critical analysis of the above question as determined by the Rehfuss fractional method of gastric analysis. The conclusion arrived at on the basis of the experimental evidence advanced (illustrated by lantern slides) was that the bacterial content of the stomach is influenced by the saliva and that the Rehfuss method of fractional gastric analysis cannot be considered an adequate criterion in determining whether the stomach is a focus of infection.

Quantitative as well as qualitative studies were made of the bacteria found at different stages in the digestive process, employing the fractional method of gastric analysis. In order to investigate the influence of saliva on the bacterial flora of the stomach, in some experiments, a dental suction tube was kept in the subject's mouth for the removal of saliva during the gastric analysis. This made possible a comparison of gastric fractions, contaminated and uncontaminated by saliva. Bacterial counts showed a striking reduction in numbers in gastric fractions when saliva was inaccessible. The highest number of bacteria per cc. in a psychotic patient (manic-depressive; manic) where saliva was *not* removed was 48,000; where saliva *was* removed the highest number found was 32. Similar results were obtained with a normal individual and with other patients having the same diagnosis. These data take on an added significance when it is remembered that the swallowing of saliva is particularly difficult to control in manic patients. Furthermore, it is important to note that this reduction in numbers of bacteria when saliva is removed occur alike with patients having very low gastric acidity and those of a more normal type.

No correlation was found between high acidity in the stomach and low bacterial numbers, or vice versa. Streptococci were found associated with high, as often as with low, gastric acidity. Consequently, there seems to be no reason to attach undue importance to their presence, or therefore to consider the stomach as a focus of infection. This means that another factor, the saliva, is of greater importance determining the bacterial content, within certain limits. Furthermore, the fact that the bacterial count on the "fasting contents" is usually considerably lower than during the process of digestion, indicates that little or no multiplication of bacteria takes place when the stomach is relatively at rest. As might be expected, the microorganisms found in the different gastric fractions with greatest frequency are: yeasts, staphylococci, streptococci, and members of the lactic-acid and aerogenes groups. Invariably these are found in the saliva of the same patient or in the food given. Consequently,

they cannot be regarded as constituting a true bacterial flora of the normal stomach. It is of interest in this connection to note that a similar study of normal individuals yielded a bacterial flora qualitatively and quantitatively similar to that found in the psychoses.

From these various considerations it may be inferred that the stomach is not acting as a focus of infection, but merely as a receptacle for the bacteria poured into it. This is in agreement with the bacteriological investigations of others to the effect that gastric acidity is sufficient to prevent bacterial development.

Discussion: Dr. Smith Ely Jelliffe said: I have listened with a great deal of interest to this presentation. This method is a valid means of approach to this problem, and can be used as a corrective way of checking up assertions made by Dr. Cotton and others. There are, however, other factors involved in the point of view taken by Dr. Cotton which are not quite covered by the observations here set forth. While I do not hold a brief for Dr. Cotton's statements, I think his viewpoint embraces the idea that the long-standing focal infections produce such a lowering of resistance that the coördinating factors represented by the cerebral cortex are interfered with. That is, if we are to understand the psychoses of the dementia praecox variety, about which type Dr. Cotton concentrates his work, we must grant that the cerebral cortex in its organizing capacity attempts to coördinate the activities of the various organs. If any organs, therefore, are thrown out, or interfered with by reason of chronic focal infections, such a degeneration must be represented in the cortex itself in its highest organizing function. If the organs which contribute to the organism as a whole be infected, the result is a lack of synthesis of their activity in the cortex. Along these lines Dr. Cotton's observations are not entirely negated by the presentation made this evening. If we do not find decreased amount of bacteria relative to diminished function of the stomach the observations only confirm *a priori* the conclusions that common sense would bring us to believe. I believe these facts are worthy of consideration in the study of all the psychoses.

Dr. Kopeloff (closing) said: I am in general agreement with what Dr. Jelliffe has said. The material presented was but a small part of the work actually completed. We have conducted a number of experiments in regard to the influence of operative and non-operative treatment on the psychoses. In this paper I simply discussed the question of stomach infection along the lines indicated by Dr. Cotton. He claims that the stomach is a focus of infection, *i.e.*, shows low acidity and presence of bacteria, and gives autogenous vaccines on the strength of that. The next gastric analysis shows increased acidity and absence of bacteria. My work negatives these results. Other work to be reported at the American Psychiatric Association will deal with the results of operative treatment in the psychoses.

CONSIDERATIONS OF SOME EXPERIMENTAL STUDIES ON THE DEVELOPMENT OF THE NERVOUS SYSTEM

DR. CHARLES R. STOCKARD, CORNELL UNIVERSITY MEDICAL
COLLEGE (by invitation)

We shall consider in a brief and informal way some of the primary problems in the development of the nervous system.

The nervous system belongs to the general skin system, and may be called a modified part of the skin system. It is the appreciative portion of the wall or sac which separates the organism from its surroundings. The appreciative portion must be capable of effecting the underlying parts so as to call forth a response to the stimuli received from the environment. This demand seems to stand behind the evolution of the nervous system. We may scan the scale of elementary nerve arrangements as follows:

The simplest animal cell is an irritable contractile body and may in certain cases contain a fibrillar-like "nervous system."

Kleinenberg long ago recognized in the ectoderm cell of *Hydra* an outer sensory part and an inner contractile portion; he, therefore, designated it the "neuro-muscular cell."

In slightly higher forms the sensory and contractile parts apparently separated into two distinct cells connected by a fiber which passed from the superficial sensory cell to excite the more deeply placed contractile cell. In still higher forms the sensory cell became divided into a superficial end-organ cell and a deeper placed nerve cell; the cell on the surface now communicates through a nerve cell with a muscle cell.

Comparable successive differentiations actually take place during the embryonic development of higher forms, as may be illustrated by the case of the vertebrate retina which is derived from the primitive ectoderm cells and becomes differentiated into the end-cells which are the rods and cones, and the ganglion cells with their various connections. In the development of these complexes it may be shown experimentally that one part may be suppressed or absent and the other parts may become finally well formed, as, for example, the end organ or retina may not develop, or may be removed, and yet the brain center cells may arise and persist.

In higher vertebrates and in man the separation of the nerve tissue from the general skin or ectoderm takes place at a very early time in the embryo; in fact, the central nervous system is one of the earliest organs or systems to express itself in development, being second only to the primitive gut, if even to that. From this early start it continues to develop and undergo change until long after birth. Thus the developmental time or interval of development for the nervous system is extremely long. This fact renders the nervous system particularly liable to arrests or developmental interferences, since any unfavorable condition occurring at any time during devel-

opment acts particularly on those parts which are developing at the given time. Some element of the nervous system would, therefore, be effected at almost any time. We may now review a number of experiments that I have carried out from time to time which throw some light on this subject.

Effects of Arresting the Growth of the Primary System: Growth in general has an initial linear stage and a subsequent lateral expansion stage which takes place after the high rate of the linear impulse has been spent. If the initial linear stage of the central nervous system in a vertebrate embryo is suppressed, the differentiation of the body of the individual entirely fails to occur, and only an amorphous embryonic mass results, which soon dies.

On the other hand, if growth be arrested or injured after the linear growth has begun, then some of the lateral outgrowths, such as the optic vesicles and hemispheres, may be suppressed in various combinations, or all may be suppressed. In the latter case there develops nothing more than a simple tubular brain resembling the anterior end of the spinal cord. Fish embryos with such brains as this may develop to the stage of hatching, but do not hatch. They are, of course, eyeless, and are deformed also in other ways. In other cases tubular brains may develop with eyes or cyclopean eyes. Thus it is possible to suppress one group of lateral outgrowths, as the eyes, and yet have another, such as the hemispheres, develop, or vice versa.

Asymmetrical Conditions and the Question of Bilaterality: If one examines the early optic vesicles and neural folds of various vertebrate embryos, it will be noted that one lateral half or side is developing slightly faster or slower than the other. It would seem as if the two sides were somewhat independent, or rather competing with one another. In this competition the advantage of the one side over the other may be the underlying cause of left-sidedness or right-sidedness. The eye on one side comes off somewhat earlier and is at first slightly larger than the other, although finally the two eyes become practically equal in normal development. In extreme cases, however, monophthalmia may result. This also is true in the development of the primary brain ventricles, which in cases may be very small on one side. Thus a general developmental basis for unilateral arrests and malformations is clearly seen to be present in the embryonic nervous system and one side of the body may be well developed while the other side is paralyzed and deformed.

Localization of Future Stuffs or Parts in the Neural Plate: The early localization of materials for future structures in the neural plate of the embryo may be illustrated by studies on the eye or retina since this is so definite a structure and becomes extremely large before undergoing normal differentiation. A number of workers had taken it for granted that since the eyes are finally lateral in position, they originally arise from lateral positions in the neural tube. Operative experiments had been conducted from this standpoint. The "lateral" portions of the anterior neural plate were

cut away, and following this operation no eye developed, but no significance was laid to the fact that the cut had really removed the central as well as the lateral portion of the neural plate. In attempting to account for certain conditions shown by cyclopean eyes I was forced to assume that the earliest eye stuff must be originally located in the mid-line of the neural tube, and it only later develops laterally from this origin. Stuffs located in lateral parts of the early neural plate become dorso-median, since this is where the lateral tissue is finally carried. Had the eye been originally lateral the optic nerve would have grown into the side of the brain and its fibers would have crossed inside instead of outside and ventral to the brain. Though median to begin with, the eye forming stuff develops lateral to the mid-plate and becomes finally divided into the two definite eyes. Other parts are also similarly located in the median plane and have to shift to their final lateral positions.

Independence of Secondary Centers: The study of the eye parts of the brain have also shown that some of the secondary nerve centers are independent, in their development, of the existence of other parts of the complex organ. For example, the retina may be completely absent, there are no ganglion cells present to send their fibers into the brain, and so no optic nerves and no primary optic tracks, but the optic radiations and optic centers in the occipital lobes may be fully developed. This is shown in the brains of eyeless guinea pigs.

Late Growth and Differentiation: An experiment which illustrates very strikingly the long period of development of the brain was recently done by Dr. H. G. Bagg, connected with our laboratory. He found that when solutions of radium emanations were injected into pregnant rats one or two days before the birth of the young, the radium affected the brain cells of the young to the extent of destroying many of them. It is well known that dividing cells are particularly sensitive to radium, and the brain at this time is injured because it has so many cells in mitosis, while at this time other organs are more nearly in a resting condition. The tests are also greatly affected, since here, too, active cell division is taking place. Thus, injurious effects of the environment may so act as to injure the development of the central nervous system from the earliest moments of development right up to the time of birth, and certainly, as all know, long after that. The variety of the stimuli which cause these injuries have little to do with the type of injury. The kind or quality of injury depends chiefly upon the developmental moment when the effect takes place. Early injuries are, as a rule, more serious than later ones. For example, all of the brain cortex may become degenerated following a late injury, as with radium, and, notwithstanding this, many animals continue to live.

The Endocrine Glands in Determining the Kind and Quality of Central Nervous System: Many claim that the brain develops entirely as a response to the glands of internal secretion. It is obvious that this overstates the case. The experiments mentioned

above show that many external conditions tend to decide the manner of brain development. And certainly a study of the embryology of the nervous system shows clearly that heredity, quite aside from the heredity of internal secretions, determines the general character of the central nervous system, for example, whether it shall become the brain of a tiger or of a dog, of a monkey or of a man. Nevertheless, changes in the developmental rate of the central nervous system do affect its quality, and in so far as the rate of development, rate of metabolism, or rate of oxidation is influenced by an internal secretion during later developmental stages, we may admit the smaller peculiarities of brain growth and development are modified by the internal secretions. This is strikingly shown in the case of the cretin with an arrest of mental development corrected by thyroid administration. In the presence of such secretion the brain promptly responds.

The central nervous system, in common with all body systems, has a definitely normal rate of development. Any cause that modifies this rate to a marked degree will also modify the quality of nervous development, and the type of central nervous defect resulting from this depends upon the developmental stage at which the interference took place, and not necessarily upon the nature of the irritant producing the arrest.

The same poison or mechanical irritant may be used to induce every known deformity of the nervous system if applied at different developmental periods. A hundred different irritants will induce exactly similar deformities if applied to the embryos at the same developmental stage. From the large, easily seen deformities resulting from severe or crude treatments, it follows that many pathological conditions and abnormal nervous reactions are certainly the result of unfavorable environments acting on the nervous system during development. These arrests probably make up the greater part of the congenital nervous conditions, feeble-mindedness, etc. Probably only a few such conditions are, strictly speaking, actually inherited, *per se*, though this in no sense would indicate that they do not tend to recur in families. The exciting cause itself may be associated with some hereditary structural condition, such as a poor uterine development and bad placentation due to weak or abnormal ovaries, etc. This again shows how, in mammals at any rate, the glands of internal secretions may have something to do with malformations of the central nervous system, since they may affect the manner of placentation, and thereby the supply of oxygen to the embryo and its rate of development.

Discussion: Dr. Smith Ely Jelliffe said: On account of the monumental mass of ignorance on my own part, I am hardly in a position to discuss Dr. Stockard's communication, but certain queries arise in my mind in regard to which I would like to hazard a few questions. I am very much interested in any evidence which may be adduced to attempt to show the difference in the development of the vegetative nervous system apart from the later phyletic sensori-

motor system concerning which Dr. Stockard has presented so many interesting conclusions.

Would it be valid to say that in the early linear stages of development we are concerned with the older phyletic system so that the lateral buds—I don't know the technical terms—go through a separate development from the projicient system? I would also like very much to know about the olfactory segments. Can these be isolated? Can one draw any inference as to the development of the phyletic stage? Can you cut out the eighth nerve and eliminate the auditory and vestibular tracts which are of great importance in the projicient segments?

In another type of question, removed from the above discussion, and relating to every day matters, it is said that in the development of any series of segments there are times regulated by mitoses when certain effects can be produced. Has this any relation to the common statements in folk lore regarding pre-natal influences, which result in deformity to the child? We all know the common stories. A window drops on a pregnant woman's wrist and her child is subsequently born without a thumb or with a stump for a wrist. There is the mass of contradictory evidence of other women who suffered the same accident and had normal children in spite of it. Can this mean that in the first case the accident happened at a time when the finger buds were in active developmental stages of mitosis and thus sensitive to deforming effects?

In regard to the pigmental system,—can Dr. Stockard's remarks be said to extend to other types of pigment than the retinal pigmental system, such as the Malpighian layer? In the rats which showed hemorrhagic spots of the skin what possible embryonic relations could that have to pigment layers of the eye? Is the whole pigment system in a class phyletically related to pigments of the eye? Or is it related to the older vegetative system? I don't know whether I have made my questions clear to Dr. Stockard. I have enjoyed the paper immensely.

Dr. Gregory Stragnell said that Dr. Jelliffe in discussing Dr. Stockard's most interesting paper has remarked upon some pragmatic points which it suggests. I should like to enquire about certain post-natal conditions which seem related to the points emphasized by Dr. Stockard. We meet with results which are not perhaps so marked as in prenatal interference, but are far more complex because they occur later. Clinically we see cases in which infections interfere with the normal development and growth of the child. In children between the ages of 6 and 10 years, at the time of secondary dentition, the enamel buds are interfered with. We also encounter precocious gonadal developments, such as *pubertas praecox*, due to endocrine interference, although we do not exactly know what is its mechanism. It is more intricate but it resembles apparently prenatal interference. This brings up the question of what part endocrines play between the nervous system and the muscular and general development. Can we have any information as to what

endocrine disturbances have been observed when chemical or mechanical interference took place in the development of the embryo?

Dr. C. R. Stockard (closing) said: These are very interesting questions. In regard to the vegetative nervous system, as contrasted with the central nervous system, I think there is a little evidence that the early straight shaft might be looked upon as vegetative rather than central. In the last two years very interesting anatomical work, not yet published, has been done by E. Elliot Smith of the University of London. He has shown that the vegetative system is in the central part of the brain. All the other developments are secondary and grow into the central nervous system. The blood supply lies between the primary and secondary parts. Some years ago I thought the invertebrate nerves were the sympathetic system, but I don't feel that now. The invertebrate system controls all kinds of muscle. Arthropods have striated muscle, and this looks more like central nervous system than the involuntary system. I have not worked on the olfactory segment, but when you get cyclopia you get one naris. The auditory system is not strictly central nervous system. You can suppress the inner ear portion. Fishes don't have a middle ear, they have gills. The ampulla is first in the development of the otocyst. You can get a big dilatation of the otic vesicle and fuse the ear right through the brain. The bony part of the middle ear will depend upon the membranous labyrinth. If you transplant otic tissue anywhere you will get a cartilaginous formation around it.

In regard to prenatal impressions,—I don't think there is any evidence to connect these two things. You can't associate the condition in the embryo with any accident to the mother, except in so far as shock to the mother will arrest development. I recall one case of an achondroplastic dwarf, called the "turtle baby" whose mother was stated to have been badly frightened by a large turtle; but, as we know, achondroplasia is a hereditary condition, a true germinal mutation.

In regard to the pigmental system, the retinal pigment is different from the rest of the pigment. Other pigment is really mesenchymal, formed from migratory cells which become chromatophores.

In reference to post-natal effects,—I should have stated that the further back you get in the embryo, the more fundamental the modifications are. You have the beginning or *anlagen* as it were; later the effects are more complex. In regard to post-natal work,—we must not regard birth as anything more than an accident in the development of the individual. To say that the baby is increased by four times its weight after birth is nothing to the enormous increase, about 1000 times, in the first 9 months of its existence. The thymus can't inhibit that growth, so that the endocrinal influence has very definite limitations. In studying the question of growth we must look upon life as a whole. Trees, for instance, show a steady generalized growth, but if they have glands of internal secretion we do not know what they are. The invertebrates reach a large growth, but they have no glands of internal secretion. The giant

squid simply goes on growing as long as it lives; if you cut a limb off it regenerates; and the same with amphibians. In the more complex organisms, the mammalian and avian embryos, there is another influence besides the older generalized power of growth. The egg increases 100 times, without differentiated glands, but when it reaches a certain stage it cannot do without the stimulus of internal secretion. The human body cannot progress without the thyroid gland.

In the salamander, experiments were worked out with the attempt to bring about metamorphosis by addition of thyroid, but it was found that these creatures had a well-developed thyroid, and yet lived in the larval stage. The addition of hypophyseal secretion brought about metamorphosis. Thus it seemed that the thyroid secretion could not become active without the pituitary. In the more complex stages of development the endocrine secretions become hooked up and interdependent. Until then the animal has the generalized power of growth. This stage is very important in the development of the child as it influences the rate of oxidation and through this the determination of post-natal abnormalities. Interference always slows oxidation, and retards the parts that should be developing rapidly.

DR. PEARCE BAILEY

AN APPRECIATION AND RESOLUTIONS ADOPTED BY THE

NEW YORK NEUROLOGICAL SOCIETY MARCH 7, 1922

Death has claimed Pearce Bailey. On February 11th, after a week's illness, contracted in the performance of his duties to the state's indigent defectives, he succumbed. Thus terminated a life that was full of unselfish work for the advancement of his fellow-men. His activities in his earlier years were at first in purely neurological fields. After having graduated at the College of Physicians and Surgeons of New York City in 1889, he interested himself in the neurological clinic of that University where he became successfully Chief of Clinic and Adjunct Professor of Neurology. Dr. Bailey was President of the New York Neurological Society in 1903 and 1904. Later, in recognition of the necessity for a neurological hospital in this city, he became one of the founders of the Neurological Institute,—to this day the only institution of the kind on the American continent. He was also consulting neurologist to St. Luke's, Roosevelt, New York and other hospitals at the time of his death. He devoted his energies to the development of the Neurological Institute with all the force and vigor and initiative that in him lay; and the wisdom of his course and that of his colleagues was borne out from the very entrance of America into the great war, for it became one of the important centers in the country for the instruction of medical officers in neurology.

Pearce Bailey was appointed to the Surgeon General's Office in charge of the neuro-psychiatric department—a new venture in modern warfare, and indicative of a tremendous advance in the

selection and medical care of troops. He soon became the chief exponent of the importance of the proper elimination of the unfit and of the reconstruction of the disabled, shell-shocked troops; and for his brilliant service to the country, Congress awarded him the Distinguished Service Medal.

After his retirement from the Army, Dr. Bailey, again with a spirit of self-sacrifice, undertook to establish the Classification Clinic—a department of the Neurological Institute—through whose means he looked to help adolescent boys make the most of their possibilities in life by a proper measurement of their capacity for different fields of work. At the same time, he was appointed by the Governor of the State to the Chairmanship of the State Commission for Mental Defectives. He was indefatigable in his attempts to make the State accept the difference between mental defectives and criminals and his efforts to have these classes separated were being crowned with success, when his time came.

Those of us who have known Pearce Bailey intimately, realize the irreparable loss that his absence means, not only to American medicine, but to all who valued truth, independence of thought and fearlessness in its expression. He was the foe of sham; he never could bring himself to listen without evident impatience, or to read without chafing under it, the outpourings of the impractical, the hyperbole of the self-deluded enthusiast. Nothing was more characteristic of him after some long defense of a far-fetched, fanciful diagnosis by some member of his staff at round, than his smiling, indulgent query, "Do you really believe it yourself?" It was said so gently, with no hint or suspicion of irony, that even the victim joined in the hearty laugh that followed. This indeed was one of Pearce Bailey's great qualities,—he told the truth at all times fearlessly, regardless of consequences, but never in a way that hurt. And he always told it interestingly, with charm and grace of manner and speech. He never wasted words; indeed, some of his communications were more than laconic; one postal, mailed from the Surgeon General's Office to the Military Director of the Neurological Institute, in answer to a request for a report on a certain medical officer, contained the following: "N. G. per S. G. P. B." We all loved him; on regular division rounds, there was always the eager question, "Isn't the Chief coming to-day?" with disappointment on every face if the answer were, "Not to-day." He personally helped every one of his staff in every possible way; he practically never found fault in words, but his expression of countenance when his orders were not carried out,—his evident feeling that he was not being properly assisted, made the guilty man so ashamed of himself that no reprimand was necessary.

Many of the meetings of our Society were graced by his genial presence. His presentations were always of the highest intellectual character and he was a master at bringing at once into prominence by some ably coined phrase, the point to which he wished to draw attention. One of his very latest articles that appeared in the New York Tribune a few weeks ago, had for a title, "Shall the State Kill

Children?" At once, the query became a plea to save from capital punishment those adults that had the intelligence of the child. He had a way of going at once to the salient points of a discussion, avoiding all side questions and issues. He was an ardent searcher for the truth and discarded everything that seemed merely adventitious to such search.

The sorrows that Pearce Bailey knew in his private life were many; at no time was he free from them—there was no respite, but none could see their reflection depicted on his countenance, and few knew.

It would be supererogatory at this time to read a list of the many brochures, monographs and papers of which he was the author. They varied from earlier reports in the field of pathological neurology, to the recent publications in neuropsychiatry. His one book, which still is regarded as authoritative in its field, was first published in 1898—"Accident and Injury; Their Relation to Disease of the Nervous System." He was also one of the editors of the Archives of Neurology and Psychiatry.

Be it *Resolved*, That we, his colleagues and friends of the New York Neurological Society are deeply conscious of the great loss we have sustained in the death of Dr. Pearce Bailey. His keen intellect, his wit and humor, his integrity of purpose and character, his attainments in the fields of neurology and neuro-psychiatry—in the service of our country, compel our profound admiration; and we wish to express and record herewith our deep grief at the loss of a colleague, a friend and a great American.

I. VEGETATIVE OR VISCERAL NEUROLOGY.

2. ENDOCRINOPATHIES.

Lindblom, S. THE SIGNIFICANCE OF HYPERGLYCAEMIA IN DIABETES.
[Hygiea, Sept. 31, 1919.]

The author, stimulated by Engstrand's recent investigations into the relation of hyperglycemia to diabetes mellitus, presents certain hypotheses which are largely based on Engstrand's material, but which do not tally with his conclusions. The author reports that diabetes patients are often discharged from hospital much improved, without sugar in the urine. But their hyperglycemia still exists. In health the formation and destruction of sugar in the body are evenly balanced; there is a state of stable equilibrium. When overproduction threatens, hyperglycemia ensues because the kidneys are comparatively impermeable to sugar. This hyperglycemia provokes the system to diminishing the production and increasing the destruction of sugar, and it thus restores the sugar equilibrium. But in diabetes this reaction of the body to hyperglycemia is impaired; the sugar equilibrium cannot be restored without sugar escaping into the urine. In other words, before the sugar content of the blood has become great enough to provoke the system to restore the sugar equilibrium the kidneys have let some of the sugar escape. Hyperglycemia is, in a sense, helpful—a stimulus to the system to restore the sugar equilibrium. When, in diabetes, the permeability of the kidneys to sugar is diminished by renal sclerosis, hyperglycemia reaches such a height that even though the responsiveness of the system to the stimulus of hyperglycemia is lessened, the production of sugar is diminished and its destruction increased. Hence a partial or complete restoration of the sugar equilibrium. The author compares this beneficial action of hyperglycemia with that of increased blood pressure in arteriosclerosis. The latter helps to drive the blood through rigid arteries, the former is required to supply comparatively powerful stimuli to the sugar-regulating mechanism which is incapable of responding to normal comparatively weak stimuli. But just as a high blood pressure ultimately aggravates arteriosclerosis, so hyperglycemia tends to lessen the irritability of the mechanism regulating the production and destruction of sugar. The author has noted that the constant passage of sugar through the kidneys diminishes their permeability to sugar, and he makes the suggestion that sugar disappears from the urine because of, not in spite of, the persistence of hyperglycemia.

Heinekamp, W. J. R. ADRENALIN, HEART AND MORPHINE. [Journ. of Pharmacology & Exper. Therapeutics, Dec., 1919.]

In a series of seventeen dogs to which therapeutic doses of adrenalin were administered intravenously, it was found that cardiac inhibition and slowing of the heart rate were produced in fourteen, or 82 per cent. Previous administration of morphine was found to increase the amount of inhibition produced by adrenalin. The experiments led to the further conclusion that adrenalin has a direct central action and is synergistic with morphine. Morphine to a degree sensitizes the vague center. The increased inhibitory action of adrenalin following morphine is due to the morphine sensitization together with the adrenalin-morphine synergism. The increased blood pressure caused by adrenalin plays but a slight part in inducing the inhibitory slowing of the heart rate.

Weber. PIGMENTATION OF MUCOUS MEMBRANE NOT CONNECTED WITH ADDISON'S DISEASE. [Quart. Jour. Med., 1919, 404.]

A patient is here reported, fifty-seven years old, a Hungarian Hebrew, with remarkable pigmentation of the buccal mucous membrane of the palate and lips. There was no pigmentation of the skin. Necropsy showed extensive miliary tuberculosis without involvement of the pancreas, pituitary or pineal body or either suprarenal, and no cause for the pigmentation could be discovered. In conclusion the author says: "There is a certain group of cases in which pigmentation, not connected with Addison's disease, occurs in the mucous membrane of the mouth. The pigmentation is in the form of blackish spots and patches in the mucous membrane of the lips or cheeks and sometimes of other parts of the mouth. It is associated with pigmentation of the skin of the face, especially about the mouth and possibly of other parts of the body. It occurs in persons of dark complexion, perhaps especially in Roumanian Jews and in certain races such as Lascars. It is of unknown causation and seems in some cases to be of "physiological" or perhaps of atavistic origin. It may be analogous to the black patches often present in the oral mucous membrane of dogs and other animals. It appears to be allied to simple pigment nevi of the skin on the one hand and to freckles on the other. Jonathan Hutchinson was probably the first to call attention to this class of pigmentation, which perhaps should include various cases published by French authors under the headings "physiological pigmentation" and "racial pigmentation."

Baillod. THE INFLUENCE OF THE OVARIES ON ADRENALIN HYPERGLYCAEMIA. [Korr. f. Schweiz. Aerzte, 50, 1919.]

Baillod has investigated the action of adrenalin injections (which normally produce hyperglycemia) in women in whom ovarian function is in abeyance or diminished. After ovariectomy and x-ray treatment, and in those past the menopause, the effect of adrenalin injection upon the blood-sugar content is quicker and more pronounced, and is produced by

smaller doses than in normal women; the alteration of effect is more conspicuous after ovariectomy with complete destruction of ovarian influence than after the diminution of ovarian influence which follows x-ray treatment or the onset of the climacteric. Similar findings resulted from experiments on rabbits.

Weber, F. P. A NEW CASE OF LIPODYSTROPHIA PROGRESSIVA. [British Children's Diseases Jour., April-June, 1919.]

This is a report of the case of a twelve-year-old girl who has been progressively losing the subcutaneous fat from her face, neck, upper extremities and trunk. The buttocks and lower extremities remained fairly plump. She has no other symptoms except an occasional catarrhal condition of the nose and pharynx. There is no evidence of the thoracic or abdominal organs being involved in any way. The urine is free from albumin and sugar. The wasting began gradually at about seven and one half years after the girl had suffered from measles, whooping cough, and pneumonia in quick succession. It is typical of lipodystrophia progressiva in regard to the distribution of the atrophy, sex, and age

Pincherle, M. HYPOTHYROIDISM AND PSEUDOHYPERTROPHIC DYSTROPHY. [Riv. di Clinica Ped., Nov., 1919.]

Evidence is presented by the author to show the importance of endocrine factors in defective nutrition and development of muscles in pseudohypertrophic dystrophy. He describes minutely the case of a boy of eleven, with thyroid deficiency from early childhood, on which a progressive muscular atrophy became superimposed. The connection between the hypothyroidism and the muscular atrophy was confirmed by marked improvement under thyroid treatment. Organotherapy is extolled.

Barbàra, M. THE THYROID AND INFECTIONS. [Annali di Clinica Medica, Oct., 1919.]

Barbàra, in agreement with others, considers the thyroid most important in the struggle against infection. His experiments showed that following thyroidectomy some of the immunization factors declined. Bacteriolysins, opsonic power and phagocytosis were modified. This defensive force diminution rendered the thyroidectomized animals more susceptible to infections. The author unfortunately does not distinguish between thyroid and parathyroid functions.

II. SENSORI-MOTOR NEUROLOGY.

3. SPINAL CORD.

Houckgeest, A. Q. van B. ASCENDING AFFECTION OF THE SPINAL CORD. [*Nederland. Tijdschr. v. Geneeskunde*, 1919, October 18, p. 1163.]

A coachman, living unhappily with his wife, with negative blood Wassermann, had for some days in 1917 severe pains in left hand, which was then dark blue. In July, 1918, paresis of right lower limb, chiefly of dorsiflexors and ab- and ad-ductors of foot: equinovarus. On November 25, 1918, examination: Right arm plus jerks; good motor power in hands, but less in right. Feeble, equal abdominal reflexes; knee-jerks plus. No Babinski. Motor power poor in right leg, not good in left. No hypertonia. All cranial nerves normal, except poor hearing, equal. No objective sensory changes. Pharyngeal anesthesia and globus. Slight sciatic pain, specially in left; no Laségue sign. A feeling of pressure of site of exit of sciatic nerve. Patient depressed, but excitable, talkative, and emotional, especially when his wife is mentioned. Electrical diminution (both forms) in right leg. The paresis is flaccid. Treatment as for hysteria did some good at first. Pains in legs went. Two months later flexion of right arm and leg and movement of right foot were almost impossible. The left leg now showed paresis, and also the trunk muscles. Then the right arm improved, relapsed, and then left arm was weak. In May and June, 1919, bulbar symptoms (dyspnoëic attacks and speech disturbances). Death on June 10th, two years after the pain and blueness of left arm and eleven months after onset of right leg paresis. (It is to be noted that the trunk was involved after the arms.) No necropsy. Houckgeest interprets his case as one resembling a chronic Landry; he thinks the most probable cause was arterio-sclerosis of spinal and bulbar arteries. He claims that he has excluded syphilis, infective agencies, polyneuritis, paralysis agitans, amyotrophic lateral sclerosis, spinal muscular atrophy, and chronic anterior poliomyelitis. He thinks the lesion involved the pyramidal path, but admits the absence of hypertonia is against it. [Leonard J. Kidd, London, England.]

Brouwer, B. THE COURSE OF THE LEG-FIBERS IN THE PYRAMIDAL PATH. [*Psychiat. en Neurolog. Bladen*, 1917, No. 2 (9 figs.).]

Brouwer gives a careful description of the course of the leg-fibers at the various levels of the pyramidal path. His material was obtained from a case of thrombotic softening: the patient, a woman, 58, had chronic nephritis: for a year she had headache and palpitation, and became nervous. She then had sudden loss of consciousness, lasting a few hours, followed by an ordinary organic right hemiplegia, with apraxia, but no sensory affection or hemianopia. Everything cleared up except the right leg which remained almost entirely paralyzed till her

death thirteen months after the stroke. Necropsy showed many small thrombotic foci in the cerebrum, and a larger one in the left paracentral lobe. In the anterior part of the pons there was diffuse secondary degeneration of the pyramidal path: in its hinder part the medial segment of the pyramidal path was not definitely affected. In the bulb the degeneration was spread out over the whole cross-section, and so it was also in the right lateral pyramidal tract in the spinal cord. The importance of this case lies in the fact that by the study of the primary focus in serial sections a lesion of other than leg-fibers was excluded. Brouwer's finding agrees in the main with that of Gierlich (1910); but whereas the latter, in his case of crural monoplegia, found the media-dorsal part of the pons more degenerated than its other parts, Brouwer did not. As to the bulb, Brouwer's case shows that in Man there is no sharp separation of arm and leg-fibers. At the pyramidal decussation he failed to confirm the teaching that the leg-fibers cross caudally of the arm-fibers. He also found no sharply defined localization of the various limb-fibers in the upper cervical cord: he cannot speak for the infra-cervical levels. He concludes that the sharply defined localization of limb-segments which is found in the cerebral part of the pyramidal path does not exist in the lower parts of the central nervous system. [Leonard J. Kidd, London, England.]

Brunner, H. BRAIN STEM OF CETACEANS WITH SPECIAL REFERENCE TO THE INFERIOR OLIVE. [Journ. f. Psychol. u. Neurol., Vol. 24, p. 138.]

The olivary bodies in cetaceans are very complicated structures and it is difficult to find the homologues in other animal species for the separate nuclei of this organ. In the whole series of mammals a medial and a lateral olivary body must be distinguished, which correspond to the two accessory olivary bodies in human anatomy. These primary olives vary in size in different species, being largest in quadrupeds and decreasing to rudimentary bodies in primates. Further there is a formation which increases in volume in the higher species and which, in primates, forms the principal olive. The olive of cetaceans contains moreover another large nucleus which, by earlier writers, is placed in parallel either with the median primary olive or with the ventral accessory of other species, but the author thinks unwarrantedly, because both the form and histological structure of this element contradict the morphological identity. This nucleus in his opinion is homologous with that of no other mammal and constitutes a formation belonging distinctively to cetaceans; it possibly is not a part of the olivary system at all but it cannot, however, be identified with any other part of the cerebellum. The peculiarities of form of the olive complex in cetaceans is in keeping with other deviations of structure of the cerebellum, the extreme development of the lateral parts being particularly noteworthy; the construction of the vermis and hemispheres is homologous with those of no other mammals. In the author's opinion it is impossible to agree with Jelgersma

who sees in the cerebellum of whales a higher evolutionary form. Nor does the author agree with Jelgersma's view that the inferior olive is to be placed on an equality with the pons as a shunting station between the basal ganglia and the vermis. The pyramids in cetaceans are for the most part situated exactly between the pons and the tegmentum, thus presenting a different localization from that of the homologous element in man. The author describes the decussation of the paths in the upper cervical medulla but leaves the question open as to the destiny of the pyramids in the spinal column after the crossing. He thinks it very probable that they run caudal in the anterior column of the spinal cord. In the cerebellar cortex of dolphins an outer nuclear layer is perceptible which according to Vogt and Astwazaturow is the material from which the Purkinje cells are constructed. The author points out that this view is untenable because in dolphins both the nuclear layer and the Purkinje cells are found to be present. [J.]

Kappers, C. U. Ariëns. STRUCTURAL LAWS IN THE NERVOUS SYSTEM. THE PRINCIPLES OF NEUROBIOTAXIS. A lecture read in the University of London. [Brain, Vol. XLIV, 1921.] And

Kappers, C. U. Ariëns. DIXIÈME CONTRIBUTION A LA THÉORIE DE LA NEUROBIOTAXIS: LE TROPISME NUTRITIF DES DENDRITES ET SON RAPPORT AVEC LES PHÉNOMÈNES NEUROBIOTACTIQUES EN GÉNÉRAL. [l'Encephale, Janvier, 1922.]

In the first named paper the author points out that the position of the nerve cells (specially the motor nuclei,¹ have been considered here, but the phenomenon is confirmed for the midbrain and forebrain, by Herrick, Ell. Smith, Dart, Kehlenbeck, a. o.) is determined by the places from which the largest number of excitations reach the cells; a process of taxis or tropism which the author has called *neurobiotaxis*, since it occurs in the nervous system during life, and this word does not include any prejudice concerning the physico-chemical basis of the process.

The author emphasizes that there is always a selection in this process in so far as this shifting only occurs if such stimuli are synchronous with functional activities of those cells.

Synchronous (or immediate successive) stimuli determine the formation and outgrowth of the neurones. This is the first law of neurobiotaxis, which apparently is analogous to the law of association, which we know to be such an important factor in the construction of our mental images.

The second law includes that the result of these correlated influences is different as far as concerns the cytoplasm and dendrites on one hand and the axon on the other hand, the former growing out or shifting to the source of stimulation (*stimulo-petal*), the latter (the axon) growing

¹ Compare also: Phenomena of Neurobiotaxis as demonstrated by the motor nuclei of the Oblongata, JOURNAL OF NERV. AND MENT. DIS. 1919.

away from the center of stimulation, following the irradiating stimulation itself (thus *stimulo-concurrent*). This stimulo-concurrent growth of the axon² has been proved by Bok. The dynamic polarization of the neurone is a result of its neurobiotactic polarization, *i.e.*, of the opposite tropistic character of axon and dendrites (which is also responsible for the irreversibility at the synaps).

The physico-chemical basis of this antipolar neurobiotactic condition is most probably a consequence of electric charges (colloid-electricity). The formation of the axon probably is caused by the action current, the formative character of which is also made probable by the influence of weak currents on regenerating fibers, whereas the dendrites (and the adult cytoplasm) migrate towards the electro-negative surface of a stimulated center. So the tropism of the dendrites appears to be a cathodotropic one, whereas the tropism of the axon—being opposite to this—is an anodo-tropic one.

The final endpoint of a stimulo-concurrent axis cylinder may be determined by an anodically increased center, as is presented by a nerve cell shortly after the cathodic increase (the stimulation curve being "biphasic"), the increase of negative electricity being immediately followed by a decrease under the normal condition, *i.e.*, by an anodic condition.

This explains also the fact (Sherrington) that the threshold of a reflex is lowered, *i.e.*, that the transmission of a current is favored by a just preceding excitation, and that a connection just established between two neurones is apt to coördinate more connections and so to establish a common final path for several other excitations occurring at about the same time in the nervous system.

The connection between motor root fibers (axons) and muscles may be also explained from this standpoint,³ the outgrowth of axons in muscles being determined by the electric condition of the muscle after a preceding non-nervous contraction (muscles are formed before the nerves). So the influence of the nerve roots on muscles would be originally more an integrating than a stimulating one. That proliferation of muscle-tissue may have the same influence as a contraction of muscle-tissue is made probable by Cajal's experiments concerning the growth of collaterals in proliferating cicatrices.

It seems probable that potassium acts an important part in directing the growth of axons (in the generation of these electric conditions), its presence being demonstrated in the axis cylinder as well as in the anisotropic discs in which the motor fibers end. Potassium being a kation, represents an anodic pole (+). That electric forces may influence

²To this may be added that very young neuroblasts (as long as no Nissl substance has developed), may also shift in the direction of the axon, *stimulo-concurrent*, as also placodecells do.

³It may also be that the negative surface electricity attracts the dendrites to the surface of a muscle (sensory muscle fibers), the interior anodic increase in the muscle substance attracting the (motor) axon.

neuronic growth is moreover experimentally shown by Ingvar⁴ in Harrison's laboratory.

In the *second paper* the author discusses the relation between the early nutritive tropism of dendrites, as is most clearly shown by the so-called horizontal cells of Cajal, and their later stimulo-petal cathodic tropism.

The author emphasizes that the part acted by the dendrites and the cytoplasm in the assimilation of oxygen, already supposed by Golgi, is confirmed by his researches on the localization of oxydizing enzymes (oxydases), which he, like Graeff, Katsanuma and Marinesco, found only to occur in the dendrites and the cytoplasm, not in the axon. Also Unna's experiments with "rongalit white," showing the presence of a large quantity of oxygen in the dendrites and cytoplasm, confirm this view.

That the nutritive tropism of dendrites and their early tendency to assimilatory surfaces (Tretjakoff) can later on change in a stimulative tropism is easy to explain from the fact that stimulation enhances the assimilation of oxygen (Mott), as has been experimentally proved by L. Hill (trans. Roy. Soc. London, Series B, Vol. 193), and as is in perfect harmony with Hering's thesis that the autonome (that is, the unstimulated, nutritive) absorption of oxygen is enhanced by an "allonome" (*i.e.*, stimulative) absorption of oxygen at the pole where the stimulus enters the neurone.

Thus nutritive and stimulative tropism of the dendrites are not contrary to each other, but the one may be transformed in the other on account of their fundamental relation. At the end of this second article the author discusses Child's booklet (*The Origin and Development of the Nervous System*), in which the electro-chemical base of the neurobiotactic process is confirmed, but which, in addition to several valuable suggestions and facts, contains some misunderstandings of the author's statements made in his Ninth Contribution on Neurobiotaxis (Journ. of Comp. Neur., Vol. XXVII, 1917).

4. MEDULLA, PONS, MIDBRAIN, BASAL GANGLIA.

Vogt, C. u. O. ON PATHOLOGICAL LESIONS IN THE CORPUS STRIATUM AND THEIR SYMPTOMATOLOGY. [Sitzungsbericht d. Heidelberg, 1919.]

In the present paper the two parts of the corpus striatum (caudate nucleus and striatum on the one hand, and the globus pallidus on the other) are analyzed. There are five sections in the paper. The first deals with the essential anatomical details of what they consider the primitive motor mechanism of the nervous system. This has not undergone any fundamental modification in man, as compared with the apes, on account of the assumption of the upright posture and the development of speech in the former, and the corpus striatum has more or less the

⁴ Reaction of cells to the galvanic current in tissue-cultures. Proc. Soc. Exper. Biol. and Med. 1920, Vol. 17.

same value in each. Among the important anatomical characters they mention are the absence of any direct pathway between the corpus striatum and the cerebral cortex, the well-developed fiber connection between striatum and pallidum mainly from the former to the latter, the descending paths from the pallidum to the subthalamic region on both sides of the brain and the presence of a definite pathway from thalamus to pallidum.

In the second section they enumerate the various syndromes of the corpus striatum and their corresponding pathological bases.

(1) *Status marmoratus* (état marbré), in which there is loss of nerve cells in the striatum, with a corresponding secondary degeneration of striopallidal fibers. Clinically, the picture is one of spastic paraplegia with athetosis and choreiform movements and a "pseudo-Babinski reflex," general limitation of movement ("Bewegungsarmut") and a general resemblance in some instances to pseudobulbar paralysis.

(2) *Status dysmyelinatus*, in which there is progressive degeneration of efferent fibers from striatum and pallidum to the thalamus and subthalamic region. Clinically, there is progressive athetosis and rigidity, developing in early infancy.

(3) *Status fibrosus of striatum*, in which there is a progressive selective necrosis of nerve-cell bodies in the striatum, with persistence of their processes, and some degeneration of striopallidal fibers. The clinical correlate is progressive bilateral chorea.

(4) *Nonprogressive status fibrosus* (part of Bielschowsky's cerebral hemiatrophy), in which there is a partial status fibrosus of the striatum, and clinically spastic paralysis.

(5) *Progressive total necrosis of the striatum* manifested clinically as torsion spasm (see Medical Science, 1920, II, 67), with general muscular rigidity, disturbances of articulation, limitation of movement, and forced laughter and weeping.

(6) *A cystic condition* of the head of the left nucleus caudatus and adjacent part of the putamen, manifested clinically as a right-sided chorea.

(7) *Focal gliosis of striatum with diffuse vascular changes* in the brain. There is athetosis and rigidity, greatly increased by peripheral or by psychical stimuli.

(8) *Status disintegrationis*, in which there are diffuse degenerative changes in both cells and processes, particularly in the caudatus. Here also there are vascular changes. Clinically, there is tremor and rigidity and forced laughter and a mask-like facies.

In the third section the symptoms are discussed singly. The characters of the rigidity alone demand a note here. They include the equal and simultaneous involvement of both agonist and antagonist muscle (unlike the spasticity of pyramidal tract lesion). This tends to the fixation of attitudes and to the impeding of free movement.

In the fourth section the physiological significance of these symptoms is the subject of analysis. The authors conclude that the striatum stands

to the pallidum in the same relation as the cerebral motor cortex does to the motor nuclei of the tegmentum and brain-stem. They draw an analogy with the results of a cortical lesion as follows: immediately after an acute cortical lesion, there is a transient phase of "cortical hyperkinesis," or of cortical irritation manifested as clonic muscular contractions; there is a second phase of flaccid paralysis, due to shock effect upon subcortical centers, and a third and permanent residual phase of subcortical hyperkinesis—that is, of spastic paralysis, in which the spasticity is due to overaction of released subcortical centers. This is the Jacksonian principle long familiar to English neurologists. The striatum has a similar inhibitory and controlling action on the pallidum and subpallidal centers. The first phase of a striatal lesion would result in the production of striatal hyperkinesis manifested as movements normally produced by the activity of the striatum (what the clinical manifestation of these may be is not clear); the second phase cannot be identified apparently from the presence of substriatal hyperkinesis, but on theoretical grounds this might be expected to be a loss of primary automatisms manifested as defective coördination of speech and locomotive movements. They regard both athetosis and choreiform movement as substriatal hyperkinesis, hence the tendency to athetosis in congenital striatum lesions. The relatively late myelination of the striatum fibers as compared with those of the pallidum may account for the similarity of the movements of the newly born to those seen in striatum lesions. (This is to add yet another comparison to the numerous ones already invoked with regard to infantile movements.)

The effect of a thalamic lesion is to cut off "affective" impulses which normally travel towards the striatum by cortico-thalamic fibers. From the thalamus association fibers pass on these impulses to the pallidum and striatum. The result is an overactivity of the released pallidum in response to sensory, emotional, and other stimuli. The pallidal symptom rigidity is due to release of subpallidal centers, but while the striatum syndrome may be unilateral (athetosis, etc.), the pallidal syndrome (rigidity) must be bilateral, since the descending connections of the pallidum are bilateral.

The fifth section deals with the general functions of the striatum and pallidum. They are centers for "primary automatisms." In the first months of life the pallidum alone controls these; later the striatum exercises a controlling and restraining action and becomes the center for all expressional and emotional movement complexes, for automatic associated movements, and for defensive reflexes. [F. M. R. Walshe, *Medical Science*.]

Spiller, W. G. ACQUIRED DOUBLE ATHETOSIS (*Dystonia lenticularis*).
[*Arch. Neurol. & Psychiat.*, 1920, IV, 370.]

Spiller reports a case of pure double athetosis with rigidity dating from early childhood and persisting until death at the age of fifty-three.

The essential lesion was in the lenticular nucleus and was bilaterally symmetrical: The putamen was practically completely disintegrated, while the globus pallidus and caudate nucleus were somewhat atrophied. There were no noteworthy changes in the cerebral cortex.

In discussing the differential diagnosis between progressive lenticular degeneration (Wilson) and pseudosclerosis (Westphal-Strümpell), Spiller draws attention to a point of some importance in estimating the physiological significance of the so-called corpus striatum syndromes named above and to which "torsion dystonia" or "torsion spasm." (Medical Science, 1920, II, 67) has now been added. While Wilson found a pure lenticular nucleus lesion in his cases, more recent investigations have indicated the presence of widespread changes in the cells of the cerebral cortex, while in the case of pseudosclerosis, which German writers now regard as the same disease as that described by Wilson, Hösslin and Alzheimer have found widespread changes in the brain, particularly in the basal ganglia, subthalamic region, pons, and dentate nucleus.

The latest investigations, recently published by Spielmeyer, also tend to confirm the view that the lesions underlying the corpus striatum syndromes are not confined to these structures, and cannot therefore be regarded as system diseases. That the latest experimental work upon the corpus striatum, namely, that of Wilson (Brain, 1913), should have given completely negative results in the sense that neither stimulation nor destruction of these nuclei in apes produced any disorder of the motor system, is significant in the light of these pathological observations.

Both aspects of the problem indicate the great caution needed in accepting the elaborate clinical and physiological analysis of corpus striatum diseases and functions put forward by the Vogts and reviewed in the present number of Medical Science. [F. M. R. Walshe, Medical Science.]

Westphal, A. A CASE OF NONPROGRESSIVE TABES. [Deutsche Ztschr. f. Nervenheilk., 1918, LX, 80.]

Westphal reports a case of tabes in a woman who was known to have had absent tendon reflexes for twenty-seven years before her death at the age of sixty. During the whole of this period there was no disability of any kind associated with these signs, which constituted the sole objective manifestations of a nervous lesion. At no time were there pupil changes, ataxy, sphincter defects, subjective or objective sensory changes, a positive Wassermann reaction, or any abnormality in the cerebrospinal fluid. It seemed probable, therefore, that the case was one of congenital absence of the tendon reflexes, of which a few have been recorded, rather than a syphilitic nervous lesion. No positive diagnosis of tabes could therefore be made during life. In 1917 the patient's general health failed rapidly and she died. On examination the spinal cord appeared somewhat shrunken, and on section showed a distinct gray degeneration of the

posterior columns. Examined by the Weigert-Pal method, the typical tabetic degeneration in the posterior columns was seen, though it was at no level profound.

The case may perhaps be regarded as an example of "monosymptomatic" or "rudimentary" tabes, and it indicates that the diagnosis of congenital absence of the tendon reflexes as a "stigma degenerationis" is one that should be made with caution. [F. M. R. Walshe, *Medical Science*.]

Netter, A. L'ENCÉPHALITE LÉTHARGIQUE. (Lethargic encephalitis.)
[*Presse méd.*, 1920, I, 193.]

In the course of a general review of the present state of knowledge of this disease, more particularly as it has been observed in France, Netter, one of the foremost observers in that country, raises some questions of theoretical and practical interest.

Among these is his grouping of the "delirium of word and action," the choreiform restlessness, the convulsions, and the "secousses myocloniques," which have been such striking features of lethargic encephalitis during the past winter, as irritative phenomena indicating the minimal effect ("atteinte minime") of the virus on the nervous system.

When more intense, its action produces paralytic phenomena. The symptoms in question have been among the most obscure nervous manifestations of lethargic encephalitis, but it is doubtful whether Netter's explanation is really applicable to the facts. He has pointed out elsewhere in this connection that such poisons as alcohol, lead, and the virus of rabies may produce either irritative (convulsive) or paralytic phenomena from their effect upon the nervous system, but there is no reason to suppose that this depends primarily upon the intensity of the poisoning. [F. M. R. Walshe, *Medical Science*.]

Brouwer, B., and Coenen, L. THE LOWER OLIVE. [*Journ. für Psychol. u. Neurol.*, 1919, XXV, p. 52 (13 Figs.).]

The writers record two cases in which pathological changes were found in the lower olivary complexes. The first was an old senile dement who died from bronchopneumonia: there was a focus of softening in the medioventral part of one cerebellar hemisphere with a considerable circumscribed degeneration in the contralateral lower olive, while the contralateral pons was normal. The second case was an infant with an occipital encephalocele which was accompanied by a hemiatrophy of the cerebellum, with a deformity in the pyramid, uvula, and nodulus, together with a hypoplasia of both olivary complexes and the pons. The writers conclude that (1) the cells of the pontile ganglia send their axons to a different part of the cerebellar hemisphere from the phylogenetically younger part of the olivary complexes; (2) the tonsil and the adjoining region of the hemisphere must represent a rich projection area of the lower olives; (3) the newer experiences show that there is good ground

for the belief that the accessory olives and the frontal pole of the lower olive must be anatomically connected with the paleocerebellum, and the larger part of the lower olive with the neocerebellum; (4) the medioventral accessory olive is anatomically connected with the pars postrema cerebelli (pyramid, uvula, nodulus, flocculus, and paraflocculus); and (5) that the very large size of the medioventral accessory olives of aquatic mammals depends on the great development of the cortex of this pars postrema cerebelli, especially the paraflocculus. [Leonard J. Kidd, London, England.]

Schaffer, Karl. MORPHOLOGY OF THE RHOMBENCEPHALON. [Ztschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVI, p. 95.]

Though Retzius has given very extensive descriptions of the morphology of the human brain, in the rhombencephalon and mesencephalon he has mainly devoted his attention to the dorsal surface. The author has examined 109 brains with special reference to the configuration of the ventral surface of the pons and oblongata. In about 80 per cent were found bundles, the boundaries of which could be easily traced in their longitudinal course. In some brains the olivary eminence was fused with the brain and the whole presented the appearance of a homogeneous construction, but generally the various divisions stood out in bold relief and the connection of these bundles with the pyramidal column was evident. As derivatives of the pyramidal region they could be divided into three groups, according as they were connected with the mesencephalon, the metencephalon, or the myelencephalon. The most clearly visible fasciculus was usually one which forked into two branches, one running in the direction of the spine and another running around the lower olivary pole, outward and upward (fasciculus arcuatus). Evidence that the fasciculi belonged to the pyramidal system was that they degenerated where there was ascending pyramidal degeneration. The tenia pontis was also found atrophied where the pyramid was affected, and on the side where the pyramid was not affected the tenia was intact. The presence of the pontobulbar fasciculi on the ventral surface in this region nearly approaches constancy, so that the author is of the opinion that they may be considered as belonging to the normal picture of the rhombencephalon. Beside the pontobulbar fasciculi, which were visible on the surface to the naked eye, there were others in the interior of the pons, some starting from the medial and some from the lateral border and running dorsally to the tegmental region, visible in the form of a more or less distinctly marked strand on the cross section. The fibers here divide and pursue two paths, the first taking a pontonuclear path, as shown by the examination of Hoche, Kosakas, Sanis, and others, and the second probably taking a pontocerebellar direction, as shown by the studies of the author and Reich. In conclusion, the author directs attention to the fact that the fasciculi branching from the pyramid partly emerge on the ventral lateral surface and are partly

visible within the cross section, therefore in the depth, and that they are therefore fasciculi superficiales and profundi. Both kinds of derivatives of the pyramid having two destinations (either they proceed to the motor nuclei of the pons or of the oblongata, or they tend to the cerebellum), the pyramidal path has, beside the corticobulbar or spinal division, also a corticocerebellar section, which indicates a direct influencing of the cerebellum by the motor spheres of the cerebrum. [J.]

v. Stauffenberg. THE EXTRA-PYRAMIDAL MOTOR SYSTEM AND REPORT OF A SO-CALLED "ATROPHIE OLIVO-PONTO-CEREBELLEUSE." [Zeitsch. f. d. ges. Neurol. u. Psychiat., Vol. XXXIX, p. 1.]

The case was that of a man sixty-two years of age who had always been healthy until the onset of the present disease, seven years before he came to the author's observation. Gradual disturbances of articulation were manifested, awkwardness and stiffness in movements, tremor in writing. Later the arms became stiff and at every innervation assumed distorted positions which could be corrected only with great difficulty. The discoördination of the separate sections of the body progressed rapidly; speech became unintelligible, spastic, explosive. Then followed disturbances of swallowing and chewing, rigidity of features, no palsies, no real spasms or contractions, depressive emotional state, restricted intelligence, reflexes normal, in recent years bladder disturbances. Death from bronchial pneumonia. Clinical diagnosis, degeneration of the lenticular nucleus region. Result of autopsy: noninflammatory atrophy of the cerebellum and the regions of the pons and olive dependent thereon; atrophy of the temporal brain, and further a degeneration of the lenticular nucleus (apparently of vascular nature, resembling arteriosclerosis), and general (secondary?) injury of the nerve cells of the motor system. The author assumes a primary degeneration of the medulla in the cerebellar hemisphere, perhaps also in the brachia of the pons. The case belongs to the olivo-ponto-cerebellar atrophy (Dejerine-Thomas). The cerebellum exercises a tonic or coördinating influence of a lower order, in part possibly directly over Deiter's nucleus and in part over the red nucleus. On this basis the coördination functions of higher order are built up the system including the red nucleus, thalamus and frontal brain, which stands as the last and highest formation above the other systems; from it proceed important dynamic influences, such, for example, as those insuring continuity of series of movements. Thus the cerebellum and temporal brain participate in the construction and conduction of complicated movements and of the impulses which permit static conditions. Of these two organs one may replace the other; the cerebellum, for instance, undertakes the smooth evolution of rapid and complicated series of innervations, especially in speech. Proper performance of these tasks presupposes that the innervation mechanism should be intact. Here the essential rôle belongs to the lenticular nucleus, and the case described is an example of a lesion in the three main organs, constituting the

mechanism, cerebellum, temporal brain, and lenticular nucleus. A system is here presented, therefore, in the center of which is the thalamus and red nucleus, in the former of which the synergic movements of expression may be assumed to be localized, while the task of the latter is to guarantee the proper regulation of the pyramidal impulses in the spinal cord, in the sense of appropriate inhibition of the agonists, thus assuring the requisite innervation processes. [J.]

Mourgue, Raoul. THE PSYCHO-MOTOR FUNCTION STUDIED IN A CASE OF HUNTINGTON'S CHOREA. [Schweizer Archiv f. Neurol. u. Psychiat., Vol. V, p. 70 and p. 240.]

Recent expositions of the true nature of Huntington's chorea now permit attempts to outline the pathological psychology of the disease. The case which the author here describes presented peculiar advantages for a study of these disturbances because of the evolutionary stage of the disease and because of the purity of the nosological type. Beginning with the clinical observation which of itself sets forth the problem in all its complexity, and avoiding all specious simplistic explanations, the author studied the instability of the intellectual equilibrium, the loss of inhibition and coördination in their relations to the intellectual weakness and difficulties of spacial subjective orientation, and further, the typical irritability of character. Pierre Marie and Lhermitte having established that the fronto-Rolandic cortex with the greater part of its fibers of projection, on the one hand, and the putamen and caudal nucleus (neostriatum), on the other, are selectively attacked by Huntington's chorea, the following facts throw additional light on the symptoms of the disease: Experiments made by Pergano on the stimulation of the caudate nucleus in dogs produced all the signs of emotion. The motor theory of intellectual phenomena adopted by Washburn, Bent Russel, etc., in America, and also developed in France by Ribot and Bergson, consider individually controlled action to depend on the voluntary psychomotor function of inhibition, and it is that psychomotor function which, in the author's case of Huntington's chorea, seems to be affected. Among various techniques employed to determine the mental condition of the patient was the inhibition test of Patrizi, which revealed the absence of the inhibitive quality and also led to the discovery of the purely endogenous origin of emotional reactions of the patient. These results were verified by a study of the pneumographic reactions when events of the patient's life which would normally produce emotion were related. It was shown (for the first time, the author believes) that there was a selective disturbance of the central representation of the sympathetic (hypothalamus?) in a case of Huntington's chorea. A great part of the author's experiments were directed to determining reaction times. Great instability of the psychomotor reaction was shown—irregularities, isolated values, enfeebling of mental discrimination. The motor theory of psychic phenomena explains much better the intellectual and affective

phenomena (loss of attention and emotional instability) which have long attracted the notice of physicians, than the old theory of the loss of images. The motor theory alone permits a synthesis of the anatomical and pathological facts in Huntington's chorea, such as have been established by Pierre Marie and Lhermitte. The psychomotor function of inhibition seems to be connected from a morphological point of view with the neokinetic system of Ramsey Hunt. This is a rational application of the chronogenic localizations of v. Monakow, that is to say, of that biological understanding of evolution upon which the future of psychiatry depends. [J.]

Bielschowsky, M., and Freund, C. S. CHANGES OF THE STRIATUM IN TUBEROUS SCLEROSIS. [Journ. f. Psychol. u. Neurol., Vol. XXIV, p. 20.]

From the study of two cases the author brings additional evidence in proof of Alzheimer's view that there is a close relationship between the pathological alterations of the nervous system in pseudosclerosis and in tuberous sclerosis. From the findings in the author's cases it appeared that the pathological formations of tuberous sclerosis may lose their tendency to preserve circumscribed boundaries and, without changing their essential characteristics, may become diffused over an extended territory of a certain organ. The resulting picture closely resembles that of pseudosclerosis. In this connection the fact is important that the two diseases manifest a predilection for the same region—namely, the striatum. The progressive changes in the glia in pseudosclerosis, however, may constitute only a part of the pathological processes receding wholly into the background in comparison with the degenerative changes. But even these degenerative components do not constitute irreconcilable differences between pseudosclerosis and tuberous sclerosis, for in the latter disease the phenomena of degeneration are not limited exclusively to the foci. The ganglion cell content of the cortex, though wholly free from foci, may be generally reduced, the destruction being conditioned by chronic processes of varying character. The author emphasizes, however, that mere histopathological resemblance does not justify the assumption of an essential identity in the two diseases. It must not be lost sight of that in the brain changes in tuberous sclerosis a gross dysgenic factor is always present, apparent in the resulting abnormalities of form of the organ, and that no similar factor is discernible in the brain changes in pseudosclerosis. Besides the disease of the internal organs and integument which accompany pseudosclerosis and tuberous sclerosis are quite different, although it is noteworthy that processes of this sort occur in both diseases. Of great interest is the pathological relationship between Wilson's disease and pseudosclerosis. Because of the close resemblance in the symptoms clinicians have assumed that these two diseases are essentially related if not identical. But a comparative study of their respective histological characters reveal extensive differences. In a case

of Wilson's disease studied by Bielschowsky the findings showed that there are pure forms of progressive lenticular degeneration such as belong to Wilson's disease with total absence of the glia findings characteristic of pseudosclerosis. There is also another form of progressive lenticular degeneration which differs from Wilson's type in that there is a characteristic parenchymatous degeneration of certain cell systems, *i.e.*, of the neurones peculiar to the putamen and globus pallidus, while the fibers arriving at these nuclei from other parts of the brain remain intact. Chronic forms of chorea resemble this type more clearly than the disease described by Wilson and Thomalla. [J.]

Bielschowsky, Max. HEREDITARY DEGENERATIONS OF THE CENTRAL NERVOUS SYSTEM, INCLUDING DISEASES OF THE STRIATUM. [Journ. f. Psychol. u. Neurol., Vol. XXIV, p. 48.]

Attention to the various disease forms of the striatum leads to a question as to how the separate types are to be grouped. There can be no doubt that the diseases in question are due to abnormal tendencies of the germ cells, and there is therefore justification in subsuming under the concept of hereditary degeneration even those forms where the heredity cannot be directly proved. A classification of those diseases which affect the striatum can only be made when the connection of the affections in this region with those which take place in other parts of the central nervous system is taken into consideration. In the light of the present advancement of pathological anatomy, the hereditary degenerative diseases may be divided into three main divisions, with subordinate groups, as follows: (1) The pure dysplasias (abnormalities depending on disturbances of the genesis of the organ), as abnormalities of the cerebral pallium, microgyria, etc., and abnormalities of the striatum (*état marbré*), or of the caudal section, micromyelia, syringomyelia. (2) Dysplasia with blastomatic characteristics (tuberous sclerosis). (3) Abiotrophies. In this group three classes may be distinguished, (a) that with blastomatic characteristics, as pseudosclerosis and certain forms of diffuse sclerosis; (b) that characterized by total necrosis of the parenchyma (necrosis of the putamen and globus pallidus), as in Wilson's disease and progressive torsion spasms or characterized by necrosis of the globi pallidi alone, of which only one case has been discovered; and (c) that group of abiotrophies with elective necrobiosis of the ganglion cells, as infantile amaurotic idiocy and (here the degeneration is confined to a distinct organ region, the nucleus caudatus and nucleus lentiformia) chronic chorea. Spastic spinal paralysis, amyotrophic lateral sclerosis and spinal muscular atrophy also belong to this latter group, the elective abiotrophic process here affecting the corticomotor system. Where it affects the cerebellar system, hereditary ataxia in its manifold modifications is the result. There are many combinations of these various diseases met with, and many transitional forms, but for this reason it is desirable to have a clear concept of the elementary types. The

author's purpose in the present outline is to set forth the relative place of diseases of the striatum, to which hitherto little attention has been paid. [J.]

Brouwer, B. AN UNUSUAL BULBAR FOCUS. [*Nederland. Tijdschr. v. Geneeskunde*, 1918, H 1, p. 1278 (1 Fig.).] -

Brouwer reports to the Amsterdam Neurological Society a case of a small thrombotic focus in the dorsolateral part of the left side of the bulb in a man, forty-three, who had had gonorrhoea but not syphilis. Onset sudden, without loss of consciousness; oppression, vomiting, severe vertigo, could hardly stand, so went to bed. Some improvement after a few days' treatment; slight headache, no vomiting, falls to left in the attacks of vertigo. On admission, falls to left if standing without support; slight horizontal nystagmus, rather slow, and lessens on extreme outward deviation. On left side of face pain; sensibility lost, and warmth and cold perception much affected, cold being always called warm. The mucous membranes were relatively insensitive to pain, but not so much as the cutaneous trigeminus area. Sensibility to cotton-wool was normal and well localized, but patient described cotton-wool stroking on his left face as duller and less plain than on his right. Normal recognition of two points. Left corneal reflex almost abolished. Motor trigeminus normal. Left hemiataxy, left dysdiadococinesis. Muscle-joint sense normal. Normal stereognosis in left hand. Great diminution of both arm-jerks; bilateral loss of knee-jerks and ankle-jerks. Left abdominal reflex barely elicitable. No sympathetic affection, except that left face was more reddened by warmth than right. Wassermann negative in blood. Diagnosis was a vascular thrombosis in the region of the left tractus spinalis trigemini. The nystagmus points to the dorsolateral part of the bulb and the ventrocaudal part of Deiters' nucleus (figured). The left hemiataxy and the falling to left depend either on involvement of the spinocerebellar tracts or of the olivocerebellar fibers. As to the homolateral diminution of the abdominal reflex and the bilateral loss of the tendon-jerks, it is known that in foci in the lateral parts of the bulb, and especially the restiform body, the knee-jerks can disappear; while this is usually homolateral, yet Senator's case shows that it may be bilateral. Brouwer found sugar ($1\frac{1}{2}$ per cent) in his patient's urine. He inclines to the belief that the patient's primary trouble was diabetes, hence the areflexia. The diabetes led to vascular changes, and the sudden onset of the vertigo and other symptoms was due to a thrombosis of one of the lateral branches of the posterior inferior cerebellar artery. [Leonard J. Kidd, London, England.]

v. Economo. WILSON'S DISEASE AND THE SYNDROME OF THE CORPUS STRIATUM. [Zeitschr. f. d. ges. Neurol. u. Psychiat., Volume 48, p. 173.]

The author describes a case of Wilson's disease in a boy of fifteen which ran a quite acute course. There was no lues. The prodromal phenomena were gastrointestinal disturbances. The disease itself began with a spontaneous fracture of the upper thigh. Though the fracture healed, there was a residuary disturbance of gait, and soon afterward dysarthria, dysphagia, pronounced salivation and mimic rigidity developed, together with a wasting of the muscles and tendency to exaggeration of tonus, which led to spasms of the neck, trunk and extremities, without heightening of reflexes or Babinski. At the section tuberculosis of the lungs and bowels was found, beside cirrhosis of the liver, a subacute tumor of the spleen and a symmetrical softening of both lenticular nuclei. Nearly the entire putamen was involved, while of the globus pallidus only the parts near the putamen were affected, and of the nucleus caudatus only the head. There was no degeneration of a long path leading downwards, and from this the author inferred that there are no long paths from the nucleus caudatus nor from the lenticular nucleus leading over the red nucleus either into the medulla oblongata or into the region of the pons. On the other hand, it was shown by following the trend of the degeneration that fibers radiate from the corpus striatum (nucleus caudatus and putamen) into the globus pallidus, where some of them terminate, while others continue their course, extending to the red nucleus, to the corpus subthalamicum and to the thalamic nuclei. The existence of a closed circuit of the striatum with the frontal brain was not apparent from findings in the author's case, but, on the other hand, connections of the putamen with the first temporal convolution, and probably also with the parietal and occipital parts of the brain, were established and were interpreted as striocortical association paths. Further, a path to the anterior central convolution could be assumed. The cerebellum was free from pathological changes. The following symptoms were especially characteristic, the spasms without paralysis, without exaggeration of reflexes and without Babinski. Chewing, swallowing and speaking were only accomplished with the greatest difficulty. The only cause which could be assumed for this hypertonia of the muscles without exaggeration of reflexes was the disease of the lenticular nucleus. Signs of motor irritability and intention tremors were not present, as was the case in some examples of Wilson's disease formerly described. The disturbances of motility constituting the amyostatic symptom complex of Strümpell, in the author's opinion, do not depend on lesions of the lenticular nucleus itself, but on an affection of the radiations of the red nucleus. The lenticular nucleus exercises an inhibiting influence on the tonus. The point of effectiveness of this inhibitory activity is not to be sought in the anterior horn of the medulla oblongata, and the inhibiting

influence does not follow the pyramidal paths. The heightening of tonus, or spasms, without exaggerations of reflex, are to be regarded as a pathognomic symptom of disease of the lenticular nucleus. [J.]

Vogt, Cecile and Oscar. PATHOLOGICO-ANATOMICAL DIFFERENTIATION OF MOTOR DISTURBANCES DUE TO AFFECTIONS OF THE STRIATUM. [Journ. f. Psychol. u. Neurol., 1918, Nos. 1 and 2, p. 1.]

On the basis of unusually rich material which was examined in serial sections in the most exact manner, the authors have arrived at a differentiation of four distinct pathologico-anatomical processes corresponding to characteristic clinical pictures. They regard the relation between the anatomical findings and the disease picture as so constant that they think it possible to diagnose the anatomical process from the symptoms and in this way to predict the course of the disease. The first of these pathological processes is the *état marbré*. It is characterized by a shrinking of the volume of the striatum (nucleus caudatus and putamen of the lenticular nucleus), in the sense that the ganglion cells, which under normal circumstances are arranged in nest form, are replaced by a net of very fine fibers containing medullary substance. In this way the striatum assumes a marbled appearance. The disease is bilateral and begins in infancy. Its extension and intensity are strictly proportional to the quantitative development of the pathological changes. The clinical picture is characterized by spastic conditions associated with involuntary movements resembling athetosis and with accessory movements. Paralytic phenomena in the narrower sense of the word are not present, but rather a rigidity similar to that which occurs in Little's disease. The second disease picture is the *état fibreuse* produced by an elective necrosis of the ganglion cells and the finer nerve fibers, so that the coarser nerve fibers which are preserved draw closer together. The tissue, therefore, seems to be abnormally rich in fibers, though the total volume of the striatum is considerably reduced. This anatomical condition finds a clinical correlate in a motor disturbance which takes the course of a slowly developing, bilateral chorea without psychical disturbances. Huntington's chorea presents the same picture as far as the striatum is concerned, but in this disease there are also changes in the brain. The anatomical substratum of the third form is a total necrosis of the striatum. There is such an extensive destruction of all the ectoderm elements of the tissue that the organ presents the appearance of a porous sponge. The process finds its clinical expression in Wilson's disease, or in conditions which resemble torsion spasms. In the fourth group belong the acute circumscribed lesions (hemorrhages or acute softenings). These conditions are clinically recognizable by their sudden appearance and by the improvement of the symptoms which soon sets in. When true paralytic phenomena are connected with the insult, the spasms and twitching make their appearance only after the process has receded. The symptomatology is variable, however, *i.e.*, presenting a picture of simple rigidity, of chorea, of athe-

tosis with spastic conditions, of pseudobulbar manifestations, or of paralysis agitans. The authors emphasize that their studies illustrate the value of pathological anatomy, the principal service of which is the discovery of constant relations between definite pathologico-anatomical changes and certain clinical disease pictures, or, as Nissl and Alzheimer have explained it in their studies of Progressive Paralysis, in the discovery of the morphological foundation for general pathological reaction forms. [J.]

Landau, Prof. THE CORPUS STRIATUM AND THE AMYGDALOID NUCLEUS. [Schweizer Archiv f. Neurol. u. Psychiat., 1919, Vol. V, No. 1, p. 171.]

The author presents the results of recent studies of the basal ganglia in embryological, comparative anatomical, and normal human material. Even in the human fetus of two months it can be determined that streaks of a gray matter unite only the putamen with the nucleus caudatus, but never the latter with the globus pallidus. At this stage and up to the fifth month (older material was not examined) the nucleus caudatus consists of different components; the laterobasal part is identical with the putamen; the innermost part, which is turned toward the ventricle, is a direct continuation of the innermost layer of the gray mass which envelopes the ventricle; the middle layer is in direct connection with the other layers of the central gray matter; only here it is much thickened and in places small dark-colored accumulations of cells are perceptible. In an embryo 4.5 cm. long the claustrum is not only entirely independent of the future island cortex, but at this stage is more advanced in development than this future island cortex. From study of the brains of adults it was shown that the claustrum cannot be regarded as the precise boundary of the island—not even as the approximate boundary. Contrary to the view of Wernicke and Brodman, the claustrum is not a part of the island cortex which has been broken off, but, as v. Monakow assumes, a consistent part of the basal ganglion, and in the anterior part is connected with the subst. perf. anter. and in the anterior with the amygdaloid nucleus. The claustrum stands in very intimate relation with the tractus olf. later., as well as with the olfactory cortex (the latter is especially clear in brains of monkeys). The amygdaloid nucleus is, contrary to the view of Obersteiner, not a thickened temporal cortex, but a constituent of the ganglia of the forebrain, and, indeed, as Edinger and Kappers hold, a modified secondary epistriatum. As such it serves as the point of beginning for the cell layer of Ammon's formation. Comparative studies of brain cuts from reptiles, insectivorous animals, rodents, carnivorous and anthropomorphic animals, led to the following general biological conclusions: From the brains of the lowest amphibians to that of man the evolution of the brain is dependent on the basal ganglia. While nearly the entire cerebral cortex of the *Seps chalcides* consists of Ammon's formation, the cerebral cortex of animals higher in

the scale has an outer cell plate resting on Ammon's layer. Even in the human brain the layer of Ammon's formation is not restricted to the archi-cortex, and the paleocortex but runs through the entire neocortex as an inner component part. There is, however, in the human brain, also, part of the cerebral cortex, which consists exclusively of Ammon's cells (partly the gyrus uncinatus and partly the gyrus ambiens of Retzius). [J.]

4a. MID-BRAIN: EPIDEMIC ENCEPHALITIS.

Perret, J. M. LETHARGIC ENCEPHALITIS.

Patient was a white male of twenty-one years, who complained of dizziness. On account of the prostration which he presented, he impressed the writer as a typhoid fever case. Dizziness continued and the throat became congested. He complained of pains in the temporo-mandibular joints. For a month the clinical course was characterized by muscular asthenia, drooping of upper lids, photophobia, opened mouth, mild fever, up to 101° F. by rectum. The somnolence was so marked that he appeared as in coma. Speech was low, slow and slurring, and for days he was unable to articulate at all. During the night he would frequently get restless, moan, and complain of pains in knees and legs. A Kernig's sign and coarse tremor of upper extremities were present. The treatment was symptomatic, X-ray of teeth having shown three abscessed teeth. These were extracted and the removal of these septic foci served to help. Blood culture was negative, as also the Widal and Wassermann, both from blood and spinal fluid. The spinal fluid was under slight pressure, and contained fifteen cells per c.mm., and an increase in globulin and culture was negative. The patient made a perfect recovery. [Author's abstract.]

Climenko, H. ENCEPHALITIS LETHARGICA. [N. Y. Med. J., March 27, 1920.]

In the last two pandemics of influenza, a disease of the nervous system was found running parallel to the influenza, to which the name encephalitis lethargica has been given. It has been pointed out by other writers, also, that similar cases of somnolence are recorded in connection with the earlier influenza epidemics. The exact relation of encephalitis lethargica to influenza, however, is not yet determined. Some are of the opinion that the same virus is the cause of both, or, in other words that encephalitis is a form of epidemic influenza. Loewe and Strauss, however, have demonstrated an organism that they claim is the cause, and with which they were able to reproduce the disease in several generations of experimental animals. If the conclusions of these authors are accepted it may be safely assumed that influenza prepares the soil for the germ described, and that encephalitis is a sequel to influenza. The pathological findings described by various authors are: Perivascular and adventitious infiltration with round cells most marked in the mid-brain,

pons and bulb; punctate hemorrhages throughout cortex and mid-brain, and at times a gross hemorrhage as the chief lesion; neuronophagia when other lesions are most marked; focal and parenchymatous infiltration with round cells; edema and congestion of a part or of the entire brain; meningitis either localized or diffused, especially marked over the sulci with infiltration of mononuclear cells.

An analysis of 34 cases at Mt. Sinai Hospital and over 20 cases in the author's private practice shows both sexes equally involved, ages from fourteen to sixty. The author has also seen a patient aged sixty-eight and a child seven weeks old with typical symptoms of encephalitis lethargica. The history shows that patients have always suffered with some acute catarrhal condition of the respiratory system, and sometimes with influenza or even pneumonia. Often the first symptom for which the patient consults the physician is insomnia; at this time there is a rise of temperature and accelerated pulse; and frequently temporary illusions and hallucinations. In some cases a true mania may develop. At about the same time choreiform twitchings, local or general, develop in some cases. Pain radiating along the distribution of some peripheral nerve is a frequent early symptom. In some cases, vomiting, drowsiness, and severe headaches usher in the disease. In a number of cases more of these premonitory symptoms may be noted, and the lethargica starts in the disease, preceded sometimes for a few days by diplopia. When the disease is fully developed, the salient symptoms are the drooping eyelids, the somnolence, the masked facies, and the rigid semiflexed extremities with a paralysis agitans tremor. The degree of somnolence varies. In most cases the patient lies with eyes closed and sleeps unless aroused, but can be awakened, answers questions, and immediately falls asleep again. In some cases the sleep is so deep as to resemble true coma. In the milder cases patients can feed themselves; in the more severe cases they must be fed. Unless bulbar symptoms are present, food is swallowed without difficulty. Paralysis of one or more of the eye muscles is usually found, and varied degrees of pupillary light reaction; the optic nerves usually show no changes. Facial paralysis, both central and peripheral, may be noted. Tremors of the tongue are of frequent occurrence; where there are bulbar symptoms, deviation and inability to protrude the tongue are present. Skin eruptions are sometimes seen. The extremities are usually held in a semiflexed position and tremors may or may not be present. In the majority of cases the mesencephalon is involved but various parts of the nervous system may be affected, and a multitude of symptoms and combinations of syndromes may be found in any series of cases. Dysarthria, difficulty in swallowing, paralysis of the palate, shallow breathing and cyanosis, are to be regarded as dangerous symptoms, although not all cases with bulbar involvement are fatal. One case is noted that showed a typical Korsakoff's syndrome together with diplopia and ptosis. The temperature at the onset of the disease is between 101° and 104° F., with 102° usual. At the onset of the lethargic state,

it may drop to normal or subnormal; the pulse is usually in proportion to the temperature. Lumbar puncture frequently, but not always, shows the cerebrospinal fluid under increased pressure; an increase in cells is almost uniformly found. A number of abortive cases were observed with neuralgic pains, headaches, diplopia, and drowsiness for a day or two, with rapid recovery. In diagnosis, the characteristic onset, the mesencephalon symptoms and the lethargica, especially during an epidemic usually present no difficulty. Where there are symptoms of meningitis, the laboratory tests will exclude that disease. Where a brain abscess is suspected, owing to ear disease, the absence of choked disk, the cerebrospinal fluid and blood picture will rule out the abscess. The majority of patients recover completely within a few weeks; in some cases, the recovery is prolonged. In fatal cases, death is usually due to bulbar paralysis. Treatment is entirely symptomatic; during the stage of excitement and insomnia, small doses of hyoscine hydrobromide may be used. Sodium carbonate counteracts the possible acidosis. Where a Sergent white line is noted, adrenalin may be given. Special attention must be paid to the bladder, and catheterization done if there is any tendency to retention. In the bulbar types, patients should be very carefully fed. Where headaches are severe, lumbar puncture is the best remedy, if no bulbar symptoms are present. Nineteen cases, of which 4 were fatal, are reported in further detail. [Author's abstract.]

III. SYMBOLIC NEUROLOGY.

2. PSYCHOSES.

Herzig, Ernst. CONCERNING THE DIFFERENTIAL DIAGNOSIS OF CONDITIONS OF STUPOR AND EXCITEMENT. [Zeitschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXVI, p. 146.]

The author discusses the possibility of discovering signs by which catatonic stupor and catatonic excitement, on the one hand, may be distinguished from manic-depressive stupor and excitement, on the other. In the nature of things no knowledge of this sort can be gained from the pathological forms themselves, from the stupors and excitements, as they are elemental psychic or psychophysical conditions; so that recourse must be had to accessory conditions. The author reviews the work of Stöcker and Kraepelin in analyzing these accessory factors, and emphasizes the following point of interest: Stupor and excitement are forms of reaction which in their essence are determined by the nature of the psyche, but which may be set in activity by injuries of various character. The psychic activities are limited to three forms, thinking, feeling, and willing, so that all injuries produce abnormalities in these spheres and the reactions are conditioned by the specificity of the response and not by that of the injury. Stupor and excitement are due to disturbances in the emotional sphere, and the question here is: Are there any signs accompanying these emotions which would indicate the nature of

the disease to which they are due? It is obvious that depressive symptoms have less differential diagnostic value than those of excitements, because the stupor consists in the absence of all activities. Every symptom belonging to manic-depressive insanity is found in catatonic diseases, while the reverse is not the case, so that positive signs for the differential diagnosis must be sought in the plus of the catatonic manifestations. The greatest difficulty is found in those cases where, while they belong to manic-depressive group, symptoms are manifested which are so similar to those of dementia precox as not to be distinguishable from them, or in cases of dementia precox which present the features of alternating excitement and depression. The symptoms distinctively characteristic of dementia precox, generally, and of the catatonic form, in particular, are the disturbances in the volitional sphere, and while catalepsy, echolalia, stereotypies are met with in other diseases, they never assume the same constant and pronounced character as in dementia precox. It is on these accessory symptoms that the differential diagnosis must be based. In the war the determination of the fundamental disease underlying a stupor or excitement was further complicated by the frequency of hysterical conditions. The ideal way of determining the disease at the root of the symptom would be by establishing some certain somatic sign by which it could be identified, but this cannot be sought in histological changes, for they are only discovered postmortem. There is more hope of finding a practical diagnostic sign in the chemical effects of the diseases in the organism. [J.]

Pilcz, Alexander. COMPARISON OF PSYCHIATRIC MATERIAL IN PEACE AND IN WAR. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, Vol. LII, p. 226 and p. 371.]

The author compares the psychiatric cases met with in his experiences as director of the psychiatric division of Garrison Hospital No. 1, Vienna, during the war period from August, 1914, to February, 1917, with those in the male division of the Vienna psychiatric clinic under Prof. v. Wagner Jauregg in the year 1913; that is to say, in peace times. In some nosological groups great differences in the percentages were found, as, for example, in the melancholias and amentias. The higher percentage of the first group the author considers due to the fact that the depressive phase of the acute functional psychoses is exaggerated by the war conditions. The relatively large percentage of cases of amentia he believes due to purely physical injuries incident to life in the field (typhus, gastrointestinal diseases, exhaustion, etc.). He merely mentions the fact of the very much larger percentage of functional psychoses without advancing any explanation as to the cause—though he emphasizes the fact that in various cases the single phases of periodic psychoses followed the same exogenous factors as were effective in producing amentia. On the other hand, the percentage of cases of paranoia and

paralysis was larger in the peace material, probably because the symptoms of these diseases in civilian classes was quickly noticed, leading to the placing of those affected in custody, while in military service the symptoms are more likely to be passed over. The same holds true of organic brain disease. For the higher percentage of arteriosclerosis the hardships of life in the field is responsible. That the percentage of those suffering from war trauma should be greater in the field needs no explanation. The difference in the percentages of alcoholic forms of psychoses is enormous, the percentage being much lower among war participants. This fact is the more remarkable when it is compared with the experiences concerning alcoholism in the Russo-Japanese war. The lower percentage of epileptic cases in the war participants is also probably connected with the absence of alcoholism. The cases of hysteria and neurasthenia were proportionally more numerous in the material from the front. The author's estimates are generally in conformity with Stiefler's in his careful study, "Ueber Psychosen und Neurosen im Kriege." Some difficulty in placing the results in parallel is experienced from the fact that Stiefler used Kraepelin's classification and the authors v. Wagner's, but where diseases are divided in the same way in the two systems the percentages coincide even to the decimals. In Part 2 of the article the separate cases of each group are carefully discussed with reference to the causes, onset, symptoms and outcome. [J.]

v. Steinau-Steinrück, Joachim. PSYCHOSES OF THE TRENCHES. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. LII, p. 327.]

The circumstance has been deplored that the manner in which psychoses originate in the trenches has not been adequately described. In the cases afterward treated information is rarely forthcoming from the field physician, and the statements of the patients throw little light on the subject. The author states that this silence on the part of the field physician is easily explained. All efforts in the field are concentrated on the immediate and practical. The physician has hardly time to cast a glance on "war psychoses," and if there are many wounded the nervous or "shocked" are not even brought to his attention. The author possesses notes on thirty-five cases observed by him during three years at the front, but only in fifteen cases are they sufficiently complete to offer any enlightening information. The first seven cases are those of persons with more or less pronounced psychopathic constitution who succumbed to the hardships of the war; the symptoms were in keeping with these influences, were colored by them, and withdrawal from the front resulted in cure in all these cases. The next six cases, of dementia precox type, furnished no evidence against the prevalent view of the endogenous origin of this disease, but the same could not be said concerning the origin of certain special phases of the disease, which, till then latent, seemed to be set into activity by events lived through. In

regard to the "pathoplastic" (Birnbaum) manifestations, the symptoms in the author's schizophrenic cases seemed in no way colored by the war—a fact which finds explanation in the nature of the disease as a disturbance of association and affectivity. The indifference and autistic tendencies of the schizophrenic it is which prevent the real horrors of the life in the trenches from making any impression. The last two cases were paralytics. While in one of these it could not be disproved that external injuries incident to life in the trenches might have determined the onset of the paralysis, yet the evidence was not sufficient to warrant such an assumption. The course of the disease in these two cases did not vary from the disease picture in peace times and the symptoms were not colored by the war experiences. The author refers to an instance of hysterical fixation as result of fright. A man was brought to him in a motionless condition because "the spinal column had been broken by concussion." No wound could be discovered, and the man was occupying the litter badly needed for the wounded. The author resorted to the heroic measure of dragging him to a standing position and letting him fall back, at the same time using forceful verbal suggestion, until the man was obliged to stand from necessity. A glass of schnapps and a cigar did the rest. The importance of the pedagogic influences of the field physician in the therapeutic handling of nervous cases in the effort to procure their adjustment to military life is illustrated by citation of a case. [J.]

Wolfer, Leo. THE TUBERCULOUS ORIGIN OF DEMENTIA PRECOX.
[Zeitschr. f. d. ges. Neurol. u. Psychiat., Vol. LII, p. 49.]

The author has observed a large number of cases of dementia precox, tracing the heredity of the persons affected, and believes he has strong evidence in support of the view that this disease is due to tuberculous influences, meaning a tuberculosis in an analogous sense to that in which Möbius speaks of a metasyphilis in regard to progressive paralysis. He thinks dementia precox might be called a metatuberculosis, and that it is caused by the fact that in the blood of precox patients tubercle bacillus albumin circulates. Variations in the condition of bodily nourishment of those affected with dementia precox, as well as the frequently observed lowering of temperature, are evidence of a far-reaching change in the composition of the blood. It would have to be assumed that the toxic tubercle bacillus albumin is under some circumstances rendered innocuous, because not all descendants of tuberculous ancestors are victims of dementia precox. It seems probable that the bacillus albumin only develops a deleterious result when disturbances of the functions of the inner secretory apparatuses are present. In support of his view the author cites the following moments in dementia precox which are evidence of its connection with tuberculosis: 1. Heredity (congenital stigmata of tuberculosis—several collateral members of the family being

frequently affected with precox). 2. Differences of pupils accompanied by the same peculiarities, in the two diseases. 3. The habitus phthisicus and status lymphaticus. 4. Accompanying tuberculous disease of the lungs, bones, glands, etc. 5. Preference for those in the early years of life, without, however, being limited to youthful persons. 6. Remissions which often approach a recovery. 7. The final unfavorable outcome. The author further suggests that the asymmetry of the skull so often observed in dementia precox may play a rôle favoring the injurious effects of the toxins. With the progressing growth of the bones of the skull the influence of their imperfect formation must become more and more apparent, leading to narrowing of the foramina by which the vessels enter the inner part of the skull, and hence to disturbances of vascularization. This would increase the vulnerability of the brain or some of its parts, on the one hand, and, on the other, would prevent the outflow of the toxins. [J.]

Porot, A. PSYCHOSES AND PERIODIC DIABETES. SYNCHRONISM OF THE ATTACKS. [*L'Encephale*, 1920, April, Vol. XV, p. 280.]

Two cases are presented by Porot which show more clearly than any previously described cases known to him the close connection between states of melancholia and glycosuria. In both cases the melancholia appeared and disappeared with the glycosuria and followed its fluctuations. In the second case the author had cured an attack of melancholia and diabetes, said by patient's wife to have followed fright, by dietary therapy, and patient had passed two years in good health. Suddenly, after a fit of violent anger, both disturbances reappeared simultaneously. This case seems to show an actual coexistence or parallelism of the two crises, the melancholia and the glycosuria, and that they arose from a common cause (the emotional shock). It is difficult to subordinate one of the elements to the other, it being impossible in the second attack to suppose an antecedent glycosuria, as the urine of the patient had been examined at regular intervals and no traces of sugar had been discovered. The author emphasizes the significance of the psychophysical interaction, suggesting that if any means were known of acting directly and specifically on the psychic element, it might be possible thereby to influence the glycosuria. [J.]

Zimmermann, Richard. ANTITRYPTIC INDEX AND ALBUMIN IN MENTAL DISEASE. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, Vol. XXXVI, p. 59.]

In a series of mental diseases accompanied by changes in the structure of the tissue, as paralysis, epilepsy, and schizophrenia, albumin decomposition products reach the circulation. This addition of foreign albumin to the blood must, according to Rusyack, affect the blood serum by increasing the trypsin, at first, and, afterward, when the reconstructive

processes set in, by increasing the antitrypsin, so that the amount of anti-trypsin in the blood serum would become an indication of the amount of albumin decomposition which had taken place (Bergman, Meyers). From the blood examinations made by the author he arrives at the following conclusions: In epileptics, paralytics, and schizophrenics there is evidence of increased albumin decomposition, expressed in the heightened anti-trypsin index. This increase of albumin decomposition may be referred to various causes, as, (1) to the changes which the white blood cells undergo (leucocytosis leucopenia); (2) to the destruction of tissue in the central nervous organ (epileptic and paralytic brain cortex, tabes); (3) to disturbances in the inner secretory organs (Basedow's disease); (4) to the cachexia in many individuals suffering from mental disease; (5) to physical diseases (tuberculosis). Proceeding on the assumption that if the heightening of the antitryptic titre is evidence of increased albumin splitting, the urine examination would also reveal disturbances of albumin decomposition, the author found that excretion of albumin is frequent in the urine of epileptics, especially after a series of seizures; in paralytics also the occurrence of albumin excretion is not rare, but it is often absent in dementia precox types. [J.]

Damaye, H. SODIUM VANADATE AND PERSULPHATE IN THE TREATMENT OF PSYCHOSES WITH ANOREXIA. [Le Progrès Médical, Jan. 11, 1920, p. 19.]

H. Damaye finds that, when psychoses or psychoneuroses are accompanied by a more or less defective state of the general physical state, good feeding, or even overfeeding, is of great value in improving the mental state. When there is loss of appetite or refusal of food, sodium vanadate and persulphate does great good. It creates a desire for food in the latter cases, and in the former cases it improves the appetite and so enables the patient to take more food and thus improves his mental state. A patient suffering from confusional stupidity, who refused food, was given a single dose of five centigrammes of sodium vanadate; next day he took food. Another, a case of melancholia with ideas of persecution, needed eighteen days' treatment by that drug before she took food of herself. When once the writer has restored appetite and induced refractory psychotic patients to take food, he gives free alimentation by raw meat and eggs, cod liver oil, and all kinds of foods which are rich in vitamins. He finds that an excellent adjuvant to this overallimentation is the iodized antiscorbutic syrup. During the treatment by sodium vanadate he uses a series of injections of sodium cacodylate. The vanadate and persulphate treatment has been of but little use in cases where there is a marked predisposition to psychoses, or when the psychosis is of very long standing; in these cases the anorexia needs feeding by the esophageal tube. The keynote of Damaye's treatment is that improvement of the psychotic patient's general state is an excellent way of improving his mental health. [Leonard J. Kidd.]

Hinrichsen, Otto. DEMENTIA AND PSYCHOSIS. [Ztschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXIX, p. 377.]

The author arrives at the conclusion that general dementia of deterioration (organic dementia) may be placed in opposition to psychotic disturbances. In schizophrenia there is a schizophrenic dementia, but there is also a dementia of deterioration which is different from the first form and is due to a reduction of the mental capacity generally, though a sharp distinction between the two forms is usually impossible. The dementia of deterioration renders disturbances due to psychotic reaction impossible, however, and in this sense may be said to cure them; the dementia may begin as psychotic and in course of development become an organic dementia of deterioration, the latter form, as it were, offering a protection against the psychic disease. The schizophrenic either manifests heightened psychic reaction or because of the advanced dementia there is absence of reaction, and just in proportion as one or the other of the conditions prevails are the emotions of exaggerated or diminished importance to him. The psychosis is a mental breakdown under a psychic strain, and in the psychotic phenomena there is an effort on the part of the organism toward self-preservation, and the dementia, too, may be understood as a defence reaction to protect the organism from total annihilation by the psychic excitement. There are also psychic excitements which are somatically conditioned, and it is only possible to distinguish these from the psychogenic where no decided dementia exists. To ask whether schizophrenia is a functional disease or not is to put the question in a too simple form. Whether it is somatic or functional depends on the strength of the fundamental disease process and to the resistance of the psychocerebral system in question. The disease picture may be so bounded off that we have an endogen degenerative process before us. But the question arises whether we are not justified in excluding from the typical disease picture the severe and incurable cases, or are not even forced to do so, by the knowledge we have of the peculiarities of this disease. If the existence of reactive psychic phases or syndromes in dementia precoc in accordance with the view of Bleuler and Jasper be conceded, then the significance of this reactive productive power for the whole mental condition cannot be denied, and such psychic activity must always be in inverse ratio to the injury which the mental faculties have sustained from organic dementia in the advance of the fundamental pathological process. [J.]

Demole. OXYCEPHALY WITH DEMENTIA AND SENSORY APHASIA. [Rév. Méd. de la Suisse Romande, 1919, XXXIX, July, p. 344.]

Demole reported to the Geneva Medical Society on May 15, 1919, the case of a man, aged sixty-eight, the subject of oxycephaly, dementia, sensory aphasia, jargonaphasia, and paraphasia; he had had syphilis. Oxycephaly was present in two of his brothers. The disease in his case progressed by successive strokes. His pupils are dilated and fixed; vision

is greatly reduced by post-papillitic atrophy. These ocular symptoms are due to the oxycephaly; it is known that oxycephaly leads to increase of intracranial pressure, necropsies having shown that it is accompanied by thinning of the cranial bones, with flattening of the cerebral convolutions, and often also internal hydrocephalus, which appears to be provoked by a bending of the Sylvian aqueduct. Demole diagnosed a lesion, probably due to an endarteritis, in the region of the left Sylvian fossa, involving in front the sensori-motor area. [Leonard J. Kidd.]

Anton, A. ROENTGEN PICTURES OF THE HEAD IN DISTURBANCES OF DEVELOPMENT. [Neurol. Centralbl., Vol. XXXVII, No. 24, p. 817.]

A Roentgen picture of a case was obtained which showed the cerebellum to consist of only a minimal remainder and the posterior fossa to be narrowed and overgrown with bone. In another case a picture was obtained which showed a hypertrophy of the cerebellum with corresponding broadening of the posterior fossa. In this case the suprarenals were stunted and the thymus was enlarged. About thirty other Roentgen pictures of the skull were obtained on which various abnormalities were visible: enlargements of the cerebellar fossa, diminished size of the same, oxycephalia with distortion of the cerebellar fossa, etc. The following summing up of these cases was given: (1) The defective development or the early wasting of the cerebellum is manifested in reduced size of the posterior fossa and a compensatory growth of the bone of the same an, sometimes, by the steep angle of the clivus. (2) The overdevelopment of the cerebellum is also discernible in the Roentgen picture, the upper boundaries of the same being usually indicated by the sinus transversus and the ridge of bone at that place. Hypertrophy of the cerebellum may be discovered by the Roentgen photograph more easily than by any other method; it is only rarely accompanied by choked discs and tumorous phenomena. Where there is oxycephalia other anomalies of the skull are usually recognizable not dependent on the premature closing of the coronal suture, for oxycephalia is a partial phenomena of a general disturbance of development in which the inner secretory glands play a rôle. The discrepancies between the capacity of the skull and the space taken by the brain may be visibly perceived in life by means of the Roentgen photograph. The veins, especially on the convex upper surface of the brain, also become visible, and the Roentgen photograph is therefore a valuable guide in operations, permitting the veins to be avoided. [J.]

Schaffer, Karl. MICRO-MORPHOLOGY AND THE ANATOMICAL CHARACTERISTICS OF INFANTILE AMAUROTIC IDIOCY. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVI, p. 1.]

The following abnormalities were discovered in a case of infantile amaurotic idiocy examined by the author: the regio precentralis showed a distortion of its boundaries so that the line of demarkation between the precentralis and the postcentralis was not situated in the fundus of the

central sulcus but in the occipital slope of the precentral convolution. The extension of the area striata could be traced on the convexity beyond the occipital pole, on the one hand, and, on the other, included nearly the entire lingualis convolution, so that the cortical visual field was much more extended than under ordinary circumstances. The area striata showed an overdifferentiation of the cytotoxic components, resulting in an extraordinarily richly stratified visual cortex. These are structural peculiarities of the monkey's brain and indicate the pithecoïd form of the brain in infantile amaurotic idiocy; that is to say, its primitive conformation. From these facts it may be conclusively inferred that this disease is due to an inferiority of organization with an endogenous tendency to early destruction. The tectonic anomalies in heredo-degeneration of the cerebellum cortex may assume one of two forms, namely, that of deviations of structure in the sense of a lower (pithecoïd) organization, or of a deviation in the sense of ontogenetic alterations. The first leads to amaurotic idiocy, the second to Huntington's chorea. One manifestation of the infantile amaurotic idiocy is the disturbance of development of medullary sheaths in the phylogenetically younger structures, where the medullary element fail to reach maturity, in marked contrast to that which takes place in the phylogenetically later formations (Rhombencephalon, mesencephalon, etc.), for here this element attains perfect development. Infantile amaurotic idiocy may, therefore, be called a disease of a phylogenetic system. The inroad of the disease in the inferiorly developed central organ leads to a rapidly progressing degeneration, resulting in a general destruction of the ectodermal hyaloplasm and, finally, of all the neural and glial elements. As the only form of hereditary degeneration which the author studied was infantile amaurotic idiocy, he cannot affirm with certainty that the other forms of hereditary nervous disease present the same characteristics, but morphological stigmata may be anticipated in other forms—and, among them, in the neuropathic diathesis. [J.]

Kraepelin, Emil. THE STUDY OF PSYCHIATRIC DISEASE FORMS. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. LI, p. 224.]

The time has long passed for regarding clinical psychiatric study as a fruitless task. The problem before psychiatrists of to-day is to define and group the various psychiatric disease forms. All effort must, in the future as in the past, be directed toward careful observation and accurate description of the clinical forms under which mental diseases make their appearance. The clinical signs are often deceptive, however, because quite different diseases have very similar disease pictures, or the symptoms may change even during the course of the same case. Besides, the personal equation is of very great importance in the determination of the symptomatology of mental diseases. The course and outcome of the same disease may not always be the same, and it is often difficult to distinguish between the real cause and the activating factor. In only a part of the cases are there autopsy findings, and these are not

rarely obscure or ambiguous. The insight gained by the action of therapeutic agents on certain diseases has, for the most part, led to only doubtful conclusions. Despite all these difficulties it has been possible to establish the essential connection between the originating conditions, the symptoms, course, outcome and anatomical foundation of some mental diseases. While it is only for cretinism (because of the astonishing results of specific treatment) and general paralysis that this knowledge approaches completeness, yet the fact that in these instances an exact diagnosis may be made from the clinical picture permits the assumption that a like inner connection exists between the symptoms of other forms of mental disease. The author emphasizes the extreme importance of accurate and accessible case records. [J.]

Delgado, H. F. PSYCHOLOGY AND THE PSYCHOSES. [Crónica Médica, Sept., 1919, J. A. M. A.]

Delgado remarks that experience has shown the important part played by moral factors in the development of mental derangement; in fact, he deems this the principal factor. The new psychiatry, he declares, is based on psychology, while the textbooks and medical schools lead the student only a few steps into the vast field of psychologic processes. Psychoanalysis reveals that mental derangement may be caused by factors of a moral order, moral conflicts, and that the hallucinations, gestures and attitudes of the insane are all important clues for the psychologist, revelations of profound and vital significance for treatment. Of course every psychic process has its molecular concomitant, but Delgado reiterates anew "the priority of the function—the conception which is rejuvenating medicine in all its branches now." "Modern endocrinology is also demonstrating the connection between the psychologic activity and the somatic activity, and the influence of one on the other. Psychoanalysis has further shown the importance of organic inferiorities as factors in the psychogenesis of neuroses and psychoses, and in the physiologic estimation of the processes resulting from 'undrained' emotions."

Hennes, H. THE "READING TEST" FOR COMPREHENSION. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. LI, p. 96.]

In the author's examination of a large number of soldiers with nervous diseases, including many suffering from head wounds or skull traumas, a frequent complaint met with was the inability to comprehend. The usual methods of asking the patient what he had seen (optic understanding) in a picture shown him, or heard (acoustic understanding) of a story related to him, was found inadequate, for the reason that it was found impossible thus to determine whether the patient had merely not comprehended or had not remembered what he comprehended or was unable to repeat what he had understood and remembered. The author believes that in his "reading test" he has found a valuable method of measuring the capacity of comprehension alone. He makes use of the circumstance that the eyes, in reading, pass in jerks over the lines and

that the recognition of the meaning must take place during the pauses between the jerks. During these pauses the eye at the same time takes in a certain part of the line—a series of letters to the right and to the left of the point of fixation. The scope of this field was assumed to be dependent on the power of comprehension. Experiments were made with normal persons, both those accustomed to reading and those whose education and calling gave little familiarity with literary pursuits. By this means certain averages were arrived at with which the results obtained from the patients could be compared. A causal connection could be proved between the capacity of understanding, on the one hand, and the time it took to read and the number of pauses and backward jerks, on the other. These tests were then applied to a large number of soldiers and civilians suffering from nervous disease. Contrary to what might have been expected from the complaints of patients diagnosed as suffering from functional disturbances, hysterics, neurasthenics, those having psychopathic constitutions, etc., the author was surprised to find that the reading tests showed no diminution of comprehension. The same negative results were obtained from a few hebephrenics and from three genuine epileptics. The results were quite different, however, where there was evidence of organic injury of the higher mental faculties. In these cases the pauses were frequent, and numerous backward movements were made, indicating that the patients were obliged to go over the preceding "field" in order to understand it. It became apparent that the reading test is adapted to assist in distinguishing functional from organic disturbances. In cases of true pseudodementia so far examined by the writer the reading test furnished an unambiguous result corresponding fully with those generally recognized as the best for differentiating this affection from true dementia. The results are not so clear in dementia precox and manic-depressive groups. The greatest number of pauses and glances backwards was in a case of chronic alcoholism. An advantage of the test is that it can be applied quickly and without special apparatus—a great advantage for the practical neurologist and psychiatrist. [J.]

Schultze, F. E. Otto. INDIVIDUAL DIAGNOSTIC STUDIES II. SECTION-PICTURE TEST. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. L, p. 98.]

The author emphasizes the necessity of having tests adapted to determine, not a single mental function, but all that go to make up the character—volition, intelligence, temperament, etc. The section-picture test recommends itself because of its simplicity; it may be used with children from eight to ten years, and the performances are little influenced by previous educational advantages. The person whose intelligence is to be measured is required to fit together pictures cut into twenty sections and laid before him in random order. There are four such pictures. The behavior of the patient in fitting the sections together should then be

carefully observed. Three hundred persons were tested by the author, and the results are here summed up. The majority quietly matched the sections, and nothing remarkable in their behavior was noticed. Those who were of limited intelligence or feeble-minded hesitated, began again, put parts without any connection together—proceeded in a wholly mechanical manner. For establishing a standard fifty-two normal individuals were tested. The author believes the section-picture test as used by him gives a better oversight of the various factors of intelligence than the computation tests. The principal points for diagnostic opinions are as follows: Normal individuals in full possession of their faculties lay the four pictures in a single sitting and without difficulty. If this is not done the individual is not normal or is obstinate. For determining asthenia the section-picture test is applicable only for those suspected of malingering or for severe cases, which is not associated with too slight degree of intelligence. Opinions are always to be found with reference to the general behavior. To determine gross defects in the ability to make optic combinations the test with one picture is sufficient; for more exact determinations, with two or three. The tests as here described are applicable for adults of from twenty to forty-five years; for children special adaptations are necessary. [J.]

Rehm, O. WEIGHT AND MENSTRUATION IN ACUTE AND CHRONIC PSYCHOSES. [*Archiv. f. Psychiat. u. Nervenk.*, 1919, Vol. LXI, p. 285.]

The author explains his discussion of these two subjects in one article by stating that disturbances of menstruation stand in close connection with the bodily processes in the psychoses, and hence with the weight. The material upon which he founds his conclusions consisted of 190 patients, almost exclusively women. Seizures in epilepsy as a rule caused loss of weight; in many cases where there were repeated seizures the weight increased. Remarkable increase in weight is observed in both epilepsy and dementia precox. Acute mental disturbances are characterized by pronounced variations of weight; chronic forms by constancy, though in the chronic stages of dementia precox the weight does not follow the clinical behavior as it does in manic-depressive insanity. In manic-depressive insanity the weight follows the psychomotor conditions, not the affective. In manic-depressive insanity little result is to be anticipated from artificial feeding, in contrast to what takes place in dementia precox. Too early dismissal from treatment in manic-depressive insanity results in a fall in the weight curve. Independence of the bodily weight of the clinical symptoms indicate relatively independent somatic disturbances, that is to say, of metabolism or of the inner secretions. From a psychiatric point of view three questions are of importance in regard to menstruation: (1) Are the processes of menstruation capable of producing psychic alterations of pathological nature? (2) Are already existing psychoses influenced by menstruation? (3) How frequently do disturbances of menstruation occur in the course of psychoses?

In answer to the first question the author states that an emotional excitability in the premenstrual period is generally recognized, and that usually it is of psychopathological character. Not a few hysterical paroxysms owe their origin to the affective disturbances of this period. On the other hand, the author is of the opinion that there is no connection between epileptic seizures and the menses, and also that menstruation has no influence on the phases of manic-depressive insanity. In answer to the second question, it is stated that the only influence to be expected from menstruation on an already existing psychosis is in the form of a short-lived alteration, as, for instance, in melancholia menstruation may give rise for a few days to greater fatigability and deeper dejection. Serious results from normal menstruation in the course of psychoses were never met with by the author. In regard to the third question, no disturbances of intensity or of the length of the period seems to occur in the various psychoses. The numerical results in the 190 cases examined by the writer showed that a large number of mental diseases were without menstrual disturbances. The temporary or total disappearance of the menses was limited to a small group of diseases, which, however, were of very different nature. These diseases were organic brain diseases, as progressive paralysis and epilepsy, and further, a disease which is also probably of organic origin, *i.e.*, dementia precox, or schizophrenia. With these were associated two diseases of functional nature, *i.e.*, manic-depressive insanity and hysteria. The percentage of cases in which there was suspension or cessation of the menses was: Paralysis, 64 per cent; dementia precox, 50 per cent; manic-depressive insanity, 36 per cent; hysteria, 19 per cent; epilepsy, 9 per cent. [J.]

Stöcker, Wilhelm. GENESIS OF INSANE IDEAS. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLIX, p. 94.]

In the author's opinion insane ideas always arise on an affective basis, and, in truth, only a few kinds of affects are concerned in their construction, namely, the purely fundamental affects of depressive or manic character and the mixed affects of anxiety and suspicion. All insane ideas are derived from these four emotional foundations, and in all mental diseases in which insane ideas are met with there are always manic or depressive pictures or mingling of both. All persecutory ideas arise from mixed manic and depressive states, *i.e.*, from anxiety or suspicion. These fundamental emotional elements do not vary, no matter what the form of the psychosis may be, whether acute or chronic. The peculiar differences in the coloring of the paranoid disease-pictures are due wholly to secondary influences, which arise for the most part from the psychic idiosyncrasies, that is to say, from the basic personality. These peculiarities consist in part of disturbances of the associative activity of the psyche and in part are due to chronic disturbances of the quantitative tonus of the emotional irritability, as in dementia precox or schizophrenia. There may also be differences due to the environment, race, sex, and degree of education of the patient. [J.]

Krueger, Hermann. CONSTITUTIONAL EMOTIONAL EXCITABILITY.
[Ztschr. f. d. ges. Neurol. u. Psychol., 1919, Vol. XLIV, p. 287.]

A series of cases are communicated, the symptoms of which consisted in a pathological heightening of emotional excitability, essentially influencing the thought, actions, and entire course of life of the individuals. These cases are examples of the psychopathic constitution and the emotional hyperexcitability here presents an isolated syndrome, in contrast to those diseases where the affective overexcitability is merely one of a complex of symptoms (in neurasthenia, traumatic neuroses, pathological weak-mindedness, epilepsy, etc.). The author considers these types as a separate group to which he gives the name constitutional affective overexcitability. As children these individuals are endowed with good intellectual faculties, but the period of peaceful development and good educational progress is interrupted by more or less frequent outbreaks of extreme temper as reaction often to a minimal external cause. These affective outbreaks, as the environment assumes greater complexity, become more numerous and serious and these children grow into adults who, with exaggerated self-consciousness, absence of all flexibility of the psychic personality, respond to every contact with the environment with strong anger; and when several irritating factors concur they may lose all reasonable self-control. Only in rare cases does the excess of affective excitability, because it is turned in upon itself, or is thwarted in efforts to spend its force on the environment, lead to suicidal tendencies. Conflicts with the laws and the consequences thereof may finally implant in these individuals a power of inhibition, so that with advancing years the emotional outbreaks decrease. From normal excitement in emotionally toned phases there are unbroken transitions to those conditions which, in the form of affective stupor, have all the signs of a pathological mental disturbance. In the affective stupor two phases may usually be clearly distinguished, the first taking the form of a general rigidity and stupor immediately following the stimulus which brings the affective tension to explosion. This is the pathological picture at the very crest of angry irritation; it lasts only a few seconds, and is followed by the impulsive phase lasting also usually only a few minutes, but in rare cases from a quarter to half an hour, in which the individual may spring at his opponent with inarticulate cries and flushed face, striking angrily in all directions. For the time of the height of the excitement there is full amnesia, which may be retrograde. Abuse of alcohol may be mentioned as one of the most frequent exogenous causes of affective overexcitability (45 per cent of the male, 10 per cent of female cases). Conflicts with the laws are inevitable. The extreme stuporous conditions are under the protection of the law, but acts perpetrated in the second phase of the affective excitement are deemed punishable. Sentences should, however, be imposed which take into consideration the irresponsibility of the individual. [J.]

Schneider, Kurt. PURE PSYCHIATRY, SYMPTOMATIC PSYCHIATRY, AND NEUROLOGY. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLIX, p. 159.]

Side by side in the same hospital and treated by the same specialist are found patients with nerve wounds and those suffering from compulsory neuroses. If to explain this circumstance it is stated that both classes are suffering from nervous diseases, it might be found very embarrassing to show precisely, in following up the assertion, wherein the nervous disease in compulsory neuroses, for instance, consists. Since the revolt led by Weygand in 1900 against the philosophic dilettantism of physiologists and brain anatomists who proceed "as though Kant had never lived," and whose studies of the central nervous system brought no more understanding of psychic life than would be obtained concerning the art of musical expression from a study of the larynx, it has been fully realized how little psychiatry has to hope for from neurology. It is known that the cerebrum is the main organ belonging to the mental processes, and farther than that we are unable to go. Practically the psychic disturbances fall into two groups which are not distinctly bounded off from each other—which, perhaps, it will never be possible to distinguish definitely. The one group consists of symptoms associated with more or less well-known brain diseases; the other group cannot be designated as diseases in the medical sense but are rather as abnormalities, types, modes of reaction. This latter group is the real field of psychiatry. Symptomatic psychiatry, that section which is concerned with the mental disturbances connected with physical disease, is a subordinate branch, and here it is always the psychic disturbance associated with brain disease which is the province of psychiatry; the brain disease itself belongs to neurology. For instance, paralysis is a brain disease, but it may nevertheless be regarded from a psychiatric point of view. Just as erroneous as it is to consider paralysis as belonging to psychiatry is it to ascribe to neurology the psychoneuroses, of which the course and mode of action cannot in the least degree be comprehended from a neurological point of view. The term nerves should never be used where psychic is meant, and organic neurology is a pleonasm because there is no neurology which is not organic. Psychoneuroses and psychopathies should not be taught as a subordinate chapter of psychiatry, but should be considered as the first and most essential phenomena in which this science is interested. [J.]

Laignel-Lavastine and Heuyer, G. TWO CASES OF CENESTHOPATHIA. [*L'Encephale*, 1920, June, Vol. XV, p. 413.]

The author had opportunity to observe two patients who appeared to present the syndrome described in 1907 by Dupré and Camus under the name of cenesthopathia. Both cases complained of abnormal painful sensations localized in the head and upper part of the body which did not correspond with the organic algeries and which were really dis-

turbances of cenesthesia. To describe these pains and to indicate their positions the patients used metaphors and more or less peculiar comparisons but all containing reference to an enlargement of the organ, numbness, twitching, of drying up, etc. The two cases were not identical in all particulars, however. In the one the cenesthetic disturbances were uncomplicated by any mental disturbances; in the other the cenesthopathia was developed on a hypochondriac foundation and assumed more or less the appearance of an obsession, though there was no delirium. The contrast between the two cases is interesting as it shows the difference of terrain upon which the same symptoms, those of cenesthopathia, had developed. [J.]

Hoppe, Adolf. INSANITY AND BELIEF. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. LI, p. 124.]

There is no objective criterion for distinguishing new religious ideas from pathological delusions. For the most part the barrenness of content of these delusions presented with extreme emphasis their distortion, incomprehensibility and egocentric orientation lead us to regard them as the product of diseased minds and as pathological subjects those who proclaim themselves the emissaries of deity. In a society at a lower cultural level, however, such persons would probably find followers who would be persuaded to perform ghastly deeds as acts of piety. The criterion by which the prophet is estimated, therefore, is the value which his messages have for the state of culture existing at the time and place of his appearance. New religions do not find response in human hearts because of the truth they contain, nor because they present the deity in a particularly understandable manner, but because the religious leader proclaims what is in the heart of the masses—because “the time is ripe.” From the close relationship of the content of belief to the cultural value for an epoch, the author states, it is possible to draw dividing lines between belief, superstition, and insanity, even though it is impossible to fix these boundaries from the truth or falsity of the content of the ideas involved. There is no cultural stage which is not conscious of its shortcomings, and there is always doubt whether, in social attainments, real values have been reached. Here religion furnishes the lacking complement or “consolation,” and history shows that with changing levels of culture the religious ideal has changed. It is in no way due to chance that an arbitrary and feudal age saw in Christianity principally equalizing justice and moral order, while our own time, a financial age, sees therein a religion of charity and devotion to the poor. It is only when a religion has lost its vitality, has fallen behind the cultural level and has become a ritual that it resembles the compulsory insanities. The pious believer fights for his idea against an unbelieving world, indeed, even against unbelief in his own mind. His attitude is always a “reaction,” there is always a possibility that the defender of the faith may weary of the strife and, relinquishing his belief, may become “like the others.” But

in the insane individual there is no such voluntary contest for the idea. The author traces the evolution of the various ideas which have dominated civilization, Islamism, scholasticism, nominalism, etc., stating that metaphysics asks objectively "What does life and the universe mean?" Religion asks the question in a subjective form, "What does all this mean to me?" being less interested in absolute existence than in other worldly values. Insanity asks no question at all, but finds ideas unsought and extends them to the falsification and exclusion of all healthy thought. [J.]

Rosenberg, Maximilian. ESTIMATION OF TIME. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. LI, p. 208.]

In persons suffering from mental disease there is often an alteration of perception of time, so that given periods seem longer than they really are, particularly in melancholias, or shorter, in various mental disturbances. The author observed both forms of alteration of time perception in a case of hysteria, which besides offered a very good idea of the complexity of the affective processes which lead to disorientation of this sort. It was one of those very rare cases in which there is a disturbance, not only of the estimation of periods as a whole, but also of the estimation of duration of shorter events falling in these periods, which all seem shorter without losing their relation to the whole. To such patients a time which is long past seems to be quite recent. When the author's patient had been in the institution months not only did the period seem a few days, but the days themselves seemed short, and the hours only a flash. At eleven o'clock in the morning the patient states that she had "just got up," etc. Bechterew in 1903 was the first to call attention to a case of this sort and in the epicrisis assumed that in certain cases of mental disease disturbances of the sense of time occur which are due to alterations of the primary images and hence not conditioned by the insane idea. The author, from an analysis of the case observed by him arrives at a different explanation. Judgments as to duration of a period depend on the number of separate memory images that emerge, and a time seems shortened if, for any reason, these memory pictures do not arise. The author made use of tests which showed that there was no disturbance of immediate primary perception of time generally, but only for those periods in which the memory pictures were connected with the psychosis. It became apparent that either a circle of monotonous ideas with strong emotional emphasis and of egocentric interest occupied the patient's field of attention (a constantly reiterated paranoid idea "that she was not in the right place"), or her attention was diverted to some accessory feature, as when she was asked to count the taps of a hammer, she attended only to the force of the separate blows—results which betrayed a schisis within certain groups of reactions from which it could be inferred that a like dissociative force was exercised on all her experiences especially in regard to time orientation. Because of this dis-

turbance of attention the separate partial experiences scarcely reached consciousness with the result that the total periods of which they were composed were also shortened. Thus the author believes that these errors in the estimation of time are not due to disturbances of primary sensations, but to faulty judgments arising from the distraction of attention by the perseverating complex "desire to go away." Because of the force of this dominating idea the period of the patient's stay in the institution did not seem short but on the other hand "tiresome." Here there is what Wundt calls a comparison with an "ideal time." The "three days" which the patient thinks she has spent in the institution seem a "too much" in comparison with her desire "not to be there at all."

Krueger, Hermann. FALSE PERCEPTIONS AND INSANE IDEAS. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. LI, p. 45.]

After reviewing the hallucinatory and delusional symptoms in the various forms of insanity the author comes to the conclusion that there are no phenomena which can be interpreted as false perceptions of sense without peripheral stimuli of some sort. All isolated hallucinations arise from an illusory falsification of actual sense stimuli which takes place at the time of the illusory perception or shortly before it. The material for the illusory misinterpretation is furnished by the vaguely or fleetingly perceived environment or by entoptic and entotic phenomena or paresthesias. Of the two factors of which hallucinations are composed, *i.e.*, the sense factor and the interpretational, it is the latter which is to be considered pathological; it may be defined as pure ideational activity influenced by the clouding of consciousness, or a one-sided direction of thought in the sense of pathologically exaggerated affects. Every false judgment attributing reality to a hallucination is an insane idea. Thus both illusions and insane ideas are conditioned by the same fundamental psychic disturbance, but the existence of the first is dependent on the existence of the latter; without pathological ideational activity there is no illusory falsification of sense impressions, while insane ideas, on the other hand, need not be accompanied by false sense perceptions. Illusions and insane idea are not, like normal perceptions, qualitatively and genetically different, but both spring from the same foundation, and a transitional form, *i.e.*, pseudohallucinations, constitutes the type of delusions most frequently met with. Both insane ideas and false sense perceptions serve the same purpose, namely, to give an objective foundation to strong affective tensions for which the patient finds no cause in his conscious experience, and which, therefore, he is unable to understand. The hallucinations and delusions are formed in response to a need felt by the patient to give a causal basis to subjective feelings and to explain them by extra-psychic processes. This motivation may take place unconsciously, though in many instances, for example in the paranoid psychoses, the process is more or less conscious. As to the localization of these disturbances, their correspondence with past psychic experi-

ences, their complexity, their extension to various sensory spheres under a guiding motive is evidence against their localization in any circumscribed region. From the nature of delusions it is not possible to regard their presence or absence as pathognomic for any particular psychic disease. Certain general inferences may be drawn from them concerning the exaggeration of the affects, the liveliness of overdetermined ideas, the disturbances of comprehension, critique, etc., in short concerning the degree of the clouding of consciousness. Preference of the hallucinations for certain sensory spheres is to a degree indicative of certain diseases; for example, optic hallucinations point to disease of acute origin or to exacerbations of chronic psychoses; acoustic and tactile hallucinations, to a quiet and chronic course of the psychic disease. [J.]

Leroy and Fursac, Rogues de. LILLIPUTIAN HALLUCINATIONS [L'Encephale, March 10, 1920, XV, No. 3.]

These microscopic visual hallucinations take the form of tiny people, the size of a finger, accompanied by proportionally sized objects or animals. They are multiple, mobile, fleeting, and usually vividly colored. They are lifelike, appear alone, or in company with other hallucinations. The patient meanwhile retains his sense of values for surrounding objects. The lilliputians are seen to pass over a table or a wall. Micropsia has never been noted as a coexistent factor with the hallucinations. Such psychosensorial disturbances are rare, though not exceptional. They may occur in toxic or toxiinfectious states. Such hallucinations have been variously noted as occurring in patients suffering from ideas of persecution, chloralic intoxication, ether drunkenness, chronic alcoholism, acute alcoholism, and febrile delirium in typhoid fever. Contrary to the usual toxic visions these hallucinations produce no fear but rather stimulate curiosity and amuse the patients. [Stragnell.]

Piéron, H. ZOÖLOGICAL PSYCHOLOGY. [Journal de Psychologie, 1920, Vol. XVII, p. 130 and p. 240.]

In speaking of psychic development it is nearly always to human progress that writers have reference. The superiority of the human mind is not so evident, however, when only the sensori motor arc is taken into consideration. Neither from the side of the receptors nor from the side of the reactions does it make itself recognizable but only in the complexity of the intermediate factors, in the multiplicity of neurones and association paths in the nervous organs. From the biological point of view the superiority of the psychic function consists in prevision—in the utilization of past events for determining the conduct which it is most advantageous to follow with reference to the future. The foundation upon which this prevision is built is the quality common to all animal forms, *i.e.*, that of acquiring modifications from experience in a sense

favorable for the preservation of life. This process includes the production of mnemonic associations. Thus a phenomenon connected with another which is of a nature to cause a reaction of pursuit or defense, itself comes to cause that reaction independently, thus permitting the animal to escape danger by an anticipative reaction. It is not impossible, the author states, that the form of mentality peculiar to man, consisting in the use of abstract symbols and logical schemas, is a sort of social patrimony, and wholly the result of life in society. It may be that man is an anthropoid and that only his life in community has rendered possible the acquirement of those logical capacities which seem to differentiate him from his brothers of lower order. For this reason the study of the social life in the perfected form in which it exists in hymenoptera as wasps and bees and in the pseudoneuroptera as ants seems to be of the utmost importance. Various facts concerning these species are extraordinary and many writers ascribe marvelous faculties to them, yet the low position they occupy in the zoölogical scale, according to man's prejudice in favor of the superiority of vertebrates, and perhaps their minute size tempt many writers to the vain task of explaining their highly complex performances as very simple reflexes. Gaston Bonnier in opposition to these writers outlines a psychosociological theory. "A single bee," he says, "never seem to give any evidence of reasoning. Individually, it never manifests anything but reflexes. On the other hand a colony considered as a being of which the separate bees are the elements unceasingly renewed, appears to us to be endowed with reason." Thus the psychology of the individual cannot alone furnish explanation of all psychic phenomena, profoundly modified as they are by social factors, and the influence of these latter constitute one of the most baffling problems given to man for solution. [J.]

Flournoy. TYPES OF TRANSIENT CLOUDING OF CONSCIOUSNESS. [Rev. Méd. de la Suisse Romande, 1920, June, p. 376.]

Flournoy describes to the Geneva Medical Society three types of transient absences or cloudings of consciousness. In the first we have absences, of some seconds' duration, extending over many years without appreciable cause, a manifestation of epilepsy. In the second, exemplified in the case of a young pianist, there are sudden cloudings of consciousness at the moment of her playing, without vertigo or loss of consciousness; these are but a symptom of fatigue, analogous to blanks of memory. In the third type there are feelings of malaise followed by fainting, lasting for some minutes, always brought about by a definite affective cause, such as fright or preoccupation, etc. These are the emotional disturbances which can simulate epilepsy, but their prognosis is not bad. They are instances of the affect-epilepsy of Bratz, or the psychasthenic epilepsy of Lépine. [Leonard J. Kidd (London, England).]

Kretschmer, Ernst. PSYCHOGENIC DELUSIONS IN TRAUMATIC BRAIN WEAKNESS. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLV, p. 273.]

The author endeavors to answer the question: "What constitutes traumatic brain weakness," or, as those who emphasize the psychic side express it, "what is the traumatic psychopathic constitution?" There seems to be a lack of clearness as to just what the typical residual general symptoms after brain trauma are. The author finds that the brains of persons who have suffered from trauma present the paradoxical condition of being more irritable than normal and at the same time less so—a phenomena which is merely a repetition of what has long been observed in other organic cerebral diseases, as, paralysis, arteriosclerosis and chronic alcoholism. In disturbances of this character the ordinary everyday emotional reactions (for family, business, etc.), are reduced; those for sudden affective impulses greatly exaggerated. There are exceptions to this general rule, however, some individuals suffering from cerebral disease or weakness presenting a constant picture of indifference or of excitability. The three types are therefore the dysphoric, the indifferent serious type, and the euphoric, and for all three there are all degrees of transition from the simple brain weakness to dementia. Characterizing the weakness which the brain trauma leaves behind, the author says the individual sustains a displacement of temperament, meaning by temperament the affective amplitude and emotional state. Discussing the special factors in the symptom complex of traumatic brain weakness which are conducive to delusional insanity he mentions the heightening of the affective irritability, the exaggerated emotional response to sudden impulses which, coupled with disturbances of association, would lead to the formation of hyperquantivalent ideas. The cerebral fatigability is also a very important factor in the development of insanity on post-traumatic basis. The author describes four cases in which the effects of three causal factors can be distinctly traced, namely that of the original character of the individual, that of the brain trauma, and that of the experience causing the outbreak, each indispensable in the production of the psychosis and individually traceable throughout its course. The disease could be called organic just as reasonably as psychogenic and the author asks why, when there is a psychic disturbance as reaction to an experience, the characterological ambiceptor which permits the reaction to the event should not be immediately sought out and traced back to its biological substratum, the somatic make-up of the brain. His aim would be to discover the cerebral foundation, not for single cases of psychoses, but for all psychological reactions, and on the other hand to analyze the psychological origin of every ideational element in organic mental disease. Just as the disturbances of affectivity resulting from weakening of the brain by trauma are determining factors in later so-called psychogenic psychoses, the endogenous brain condition will probably be found to play a role in hysterias, compulsory neuroses, etc. [J.]

Boven, William. INDIVIDUAL CHARACTER AND MENTAL ALIENATION. [Schweizer Archiv f. Neurol. u. Psychiat., 1920, Vol. VI, No. 2, p. 317.]

The author arrives at the following conclusions: The primitive individual character gives the formula of the somatopsychic equilibrium of the personality. It is possible to foresee long before the onset of a psychosis when and how the equilibrium will be destroyed. Every psychosis is at the same time psychological and organic. These are only two aspects of a single phenomenon, and it is erroneous to assume that the cause of the mental disease is exclusively in either one of these spheres. A toxic or glandular origin of dementia precox may be accepted without in the least discrediting the importance of the primitive character in the ulterior pathogenesis of the delirium. These two assumptions are not only not contradictory, but they complement each other in a most natural manner. The psychosis (notably dementia precox) is the reaction of a psychic personality to the influence of an organic agent which may be external to the nervous system. The characters of those destined to become dementia precox cases differ from infancy from the characters of future maniacs and melancholics. In candidates for dementia precox there are deviations of the social instinct, distrust, irritability, misanthropy, timidity, with tendencies to affective introversion. These traits are not usually found in the antecedents of those who come to suffer from mania or depression. Not only does the character influence the "choice" of the psychosis, but it apparently also determines the course of the delirium. Within the picture of dementia precox, for example, there are several varieties of psychosis, and the same is true of melancholia and mania. Thus vain, asocial individuals are inclined to dementia precox of grandiose type; asocial egoists, to the hypochondriac form, etc. Those individuals who reveal several deviating traits, each one alone sub-determinant, as it were (egoists who are at the same time vain, or jealous individuals who are overdevout), develop complex forms. It has long been known that intellectual qualities become manifest in most deliria, and that these latter are rich or poor according to the intelligence, the imagination and the culture of the individual. It seems to the author that besides the symptoms of distinctly psychological nature there are others more of organic nature which are also determined by the make-up of the individual. From the general asociality and persecutory ideas of schizophrenics, there is a transition to the sullen indifference which masks the misanthropic hostility, and thence to gross automatism, to profound introversion, to grimacing agitation, negativism, and perhaps mutism. Thus there appears to be a continuity of manifestations of psychic character up to a fusion with organic traits determined also by individual tendencies. Though melancholia and mania are considered as belonging to the same ethnological complex quite different traits determine the insanity of sadness and that of gaiety, as for example, the primitive character (sad or gay), the age of the patient

(older patients being inclined to melancholy), the nature of the circumstances disturbing the mind, the nature of the ideas which these circumstances arouse. [J.]

Southard, E. E. THE PRAGMATIC METHOD AND INSANITY. [J. Lab. and Clin. Med., December, 1919.]

This almost the last of Southard's addresses, given in part before the New York Neurological Society the week of his death, is here printed. He here advocates that psychiatry should more and more adopt the laboratory habit of mind, become more and more pragmatic and bring itself into line with internal medicine. Several applications of the pragmatic method to psychiatry are offered: (a) It makes a difference to the patient whether he is seen by a psychiatrist or by a clinical neurologist. There is thus a real difference between psychiatry and clinical neurology, though the future may destroy that difference and produce "neuropsychiatry." (b) It makes a difference whether insanity is taken as a unit or as a collection of entities. The pragmatic rule decides in favor of a pluralistic view of mental disorders. (c) The principle of orderly exclusion in the diagnosis of complicated cases is of pragmatic value. (d) Especially is this true in the diagnosis of neurosyphilis, where it is important to maintain the non-paretic hypothesis as long as possible, in the interest of the patient's treatment. (e) Opinions might differ as to the advisability of entertaining the hypothesis of focal brain disease before or after the hypothesis of somatic (non-neural) disease, in a given case. The pragmatic rule might decide one way for a general and the other way for a mental hospital. (f) Dementia praecox should be eliminated before manic-depressive psychosis, on the pragmatic basis. (g) The pragmatic method decides that, in the face of complete ignorance of its true nature, involution-melancholia is better placed in the manic-depressive group than in the senile-senescent group, if it is to be placed in either.

v. Monakow, Paul. CONCERNING UREMIA. [Schweizer Archiv f. Neurol. u. Psychiat., 1920, Vol. VI, No. 2, p. 183.]

Under the clinical concept "uremia" a series of phenomena differing greatly in character are included. These symptoms have nothing in common except the fact that they all occur in kidney disease and in obvious connection therewith. There are two principal views to account for the specific nature of the symptoms, namely that they are due to a chemicotoxic substance in the organism (products of metabolism retained in the body which in health are eliminated by the kidneys); or that they are due to a physicommechanical disturbance (brain edema or anemia of the brain). Ascoli was the first to show that cases of uremia did not present a uniform picture. Volhard later attempted a division of the uremic phenomena into those due to nephritic insufficiency and

those which may arise without a simultaneous insufficiency of the kidneys, considering true or retention uremia to belong to the first group, and those ascribed to brain edema (eclamptic uremia, in which toxic influences may be excluded) to belong to the second. The author expresses his objections to this division, stating that from practical observations he does not consider the residual nitrogen, which by Volhard is regarded as the standard of the insufficiency, to be any indication of the kidney function, nor to offer any proof of the presence or absence of toxic matter in the blood. Further he does not agree with Volhard's assertion that the convulsions are due to brain edema and in a number of cases found no abnormalities of spinal fluid pressure—the condition which is the main support of Volhard's theory. He states that even in the picture which is considered due to the retention, or kidney insufficiency, the complex cannot be regarded as a unity and it is scarcely possible that these various disturbances of such different nature are due to a single cause. The author turns his attention especially to the comatose conditions which may occur in all degrees of intensity from mere somnolence to profound coma. The fact that in cases of chronic kidney disease the uremic coma develops quite suddenly although the diuretic action becomes no worse and there is no essential change in the composition of the blood indicates that the retention of the substances from the kidneys in the blood is not of itself sufficient for producing the uremic coma, and that another factor is involved which may be more or less independent of the kidney function. To the author the following view seems worthy of consideration; toxic substances circulating in the blood are at times not effective because they are held at a distance from the brain by a protective membrane. So long as this membrane was intact the human brain would be uninfluenced by the uremia in the blood. If it gave way the coma would be the result. Such a protective membrane we have obviously in the plexus chorioidei. The problem was then to determine how the choroid plexus acts in reference to the products of metabolism. Experiments revealed that the plexus does not act as a mere filter, but that it has a certain selective quality, some substances passing freely through it and others being held back. Creatinin and uric acid belong to these latter substances. In three cases of severe uremia the uric acid and creatinin content of the cerebrospinal fluid was nearly equal to that of the blood, indicating that the resistance of the plexus had been broken down. In two cases of uremic coma the plexus was subjected to histological examination and very considerable changes were discovered. The author assumes that the accumulation of toxic substances in the blood leads at first simply to an injury of the plexus; finally there comes a time when the plexus is no longer able to perform its protective function and the sudden onset of the coma represents the result of this unfitness.

Roemheld, L. CONCERNING A PECULIAR REFLEX PHENOMENON IN UREMIA. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. L, p. 284.]

Since Sternberg in 1893 first called attention to the qualitative and quantitative changes of reflexes in uremia numerous observations on the subject have been published. It was later established by the author and others that the loss of inhibitions due to uremic injuries of the cortex produced heightened reflex excitability and abnormal reflex phenomena even before the onset of the attacks. The author, in the present paper, seeks to show that at the height of the coma preceding exitus the conditions in regard to the reflexes change greatly. In the case here published he describes very noteworthy reflex phenomena which made their appearance in the final uremic attack. In a woman who was in the uremic coma immediately preceding death and who manifested general cutaneous hyperesthesia with rather weak tendon reflexes the author discovered a reflex which, he states, has never hitherto been described. When the quadriceps tendon was tapped, besides the patellar reflex of the same side, there was elicited in both feet, though stronger on the homolateral side, a slow plantar reflex of the four lateral toes. Fan-like spreading of the toes was never observed. Concerning the manner in which the reflex is produced nothing definite can be said, the author states. But one of the indispensable conditions for its occurrence is evidently the heightened reflex excitability of the entire nervous system, especially of the lumbar portion of the spinal cord. Only thus could an abnormal transference from the quadriceps tendon to the tensor of the toe of the homolateral and contralateral side take place. Boehme has observed a plantar movement of the toes when the quadriceps tendon is tapped, but only on the homolateral side. In experiments with animals Magnus has observed a phenomenon which may perhaps be regarded as parallel with that in the author's case. The centripetal path of this reflex may be assumed to be in the cruralis originating in the third lumbar root, from which the centrifugal reflex path leads to the motor innervation of the source extensors of the toes which originate in the first and second sacral nerves. That in the author's case neither the Babinski nor the equivalent Bechterew-Mendel plantar reflex could be elicited may be explained by the abnormal hyperesthesia of the skin especially in the planta pedis. However that may be, the reflex phenomenon observed by the author, *i.e.*, that the tapping of the skin over the quadriceps tendon (the stimulation of a place from which, normally, a tendon reflex is elicited) produced simultaneously with a homolateral patellar reflex, also a slow plantar reflex on both sides, is an undeniable fact. Whether the phenomenon was due to peculiarities in the individual examined or whether this reflex under like conditions, *i.e.*, in the deep uremic coma

immediately preceding death where there is also hemorrhagic nephritis as in the author's patient may be frequently met with now that attention has been called to it, remains to be tested by future observation.

Klippel, M. CONCERNING THE RÔLE OF ASTONISHMENT IN MENTAL PATHOLOGY. [Journal de Psychologie, 1920, April 15, Vol. XVII, p. 336.]

The value of astonishment in its various degrees will be understood if we contemplate the result of the suppression of that psychological moment in an individual—in ourselves for instance—when facing the events of everyday life. It will not then seem strange that Aristotle should have regarded astonishment as the beginning of knowledge. When astonishment is absent there is credulity, suggestibility, absence of common sense, groundless beliefs, and various psychological states marked by lack of reason. In dreams there is no astonishment, even for the wildest phantasmagorias. In general delirium which resembles the dream, though in some respects only, the most contradictory and improbable events are accepted without surprise. Though general delirium differs from insanity properly so-called, and this latter from monomania all these forms have one feature in common—the absence of the psychological factor of surprise. The most absurd conceptions are credited without hesitation, nothing shakes the opinions of those suffering from these disturbances, nothing moves them from their beliefs, and it may be added nothing astonishes them. The absence of astonishment, therefore, seems to be the source and the equivalent of the absence of judgment, so that the symptomatology of mental deficiency ought to include absence of astonishment. [J.]

Laignel-Lavastine, N. DIAGNOSIS IN PSYCHIATRY. [Presse Méd., July 3, 1920.]

The author comments on what he calls the picturesque phase of mental disease, that is the phase in which the painter portraying the attitude, the costume and the reactions to the environment shows at a glance the nature of the mental disturbance. The picturesque, the psychiatric and the biologic diagnosis have to be considered in turn and in the proper perspective, and he relates four typical cases to demonstrate how this should be done, "proceeding from the picturesque reaction to the syndrome, the affection, and the malady." One of his examples is that of an unmarried woman interned at the request of her physician, the object of her erotic persecution. The perspective diagnosis was erotomania in a hypomanic from hyperthyroidism resulting from acute articular rheumatism at the age of 24. As a rule, however, psychiatry, as well as internal medicine, rests on the tripod; alcoholism, tuberculosis and syphilis.

Ladame, C. FULMINATING, ACUTE PSYCHOSIS. [Schw. Arch. f. Neur. u. Psych., 1919, Vol. V, No. 1.]

This term is applied to an acute type of psychosis, with a rapidly fatal termination, which presents a characteristic clinical course and histopathologic changes, indicating acute inflammation of the mass of the brain. Eight cases are described in detail. The intense motor restlessness and the rapid desiccation of the tissues and early cachexia, with signs of grave general nutritional disturbances, profound mental confusion and death in one or two weeks are the chief features.

Ravaut and Laignel-Lavastine. VARIATION IN THE ALBUMIN OF THE CEREBROSPINAL FLUID IN PSYCHOSES. [Bull. et Mem. Soc. Méd. des Hôp. de Paris, August 5, 1920. B. M. J.]

Forty seven patients suffering from various mental disorders were examined and the results of the findings in the cerebrospinal fluids here detailed: (1) Dementia precox patients showed a remarkable constancy in the amount of albumin in the cerebrospinal fluid. (2) In melancholia the albumin in the cerebrospinal fluid varied from normal to twice the normal amount. (3) In epilepsy the amounts varied according to the time of examination and the individual. (4) In several cases of cerebral defect, such as imbecility, diplegia, myxoedema, and deaf-mutism, the albumin was constantly increased. (5) Several cases of active syphilis showed typical meningeal reactions. The writers conclude that in a certain number of psychoses the cerebrospinal fluid is richer in albumin than has previously been supposed, and that the amount may vary from one examination to another. This excess in albumin is independent of any cellular reaction and may be the only indication of a disturbance of the central nervous system and the meninges.

Gosline, H. I. LOCALIZATION OF HALLUCINATIONS. [Jl. Lab. and Med., July, 1920.]

The thesis here defended is that all mental functions can be reduced to simple processes such as sensation, association, reaction and inhibition. On the basis of these fundamentals hallucinations may be reduced to simple processes and the result may be correlated with the anatomy of the nervous system. Psychology is carried into psychopathology for the purpose of making localization. Gosline's chief contribution here is the attempt to outline functional criteria regarding purely irritative and destructive agencies.

MISCELLANY

THE STORY OF "BRAIN"

COMPLIMENTARY DINNER TO DR. HEAD

A complimentary dinner was given to Dr. Henry Head, F.R.S., on May 26th in recognition of his eminent services to neurology as editor of *Brain* for seventeen years. Most appropriately, remembering the fundamental importance of his own contributions to neurology, Sir Charles Sherrington, president of the Royal Society, was in the chair.

The chairman, in proposing the health of Dr. Henry Head, said that under his direction the influence of *Brain* had been increased and extended. It formed a living bond between neurologists in England, across the Channel, and beyond the Atlantic. Every worker in neurology, wherever his lot was cast, had learned that if he took thorough work to the editor of that journal he was sure of a sympathetic hearing and of an opportunity. Dr. Head had consistently upheld the scientific method in neurology, both in his own work and in the selection of papers for publication; he had his reward in the position *Brain* had attained as a worthy representative of British science and a moving spirit in the development of neurology throughout the world.

Sir David Ferrier, at the invitation of the chairman, sketched the history of *Brain*. In 1877 some of those most interested in neurology felt that the time was ripe for the establishment of a special journal. The reports of the West Riding Asylum, the first school of neurology in this country and founded by Sir Charles Crichton-Browne in 1871, had come to an end in 1876, when their editor was appointed Lord Chancellor's Visitor in Lunacy. Under the editorship of Croom Robertson, then Professor of Psychology in University College, London, *Mind* had been started in 1876, but it was concerned mainly with pure psychology, and a journal more particularly devoted to the anatomy, physiology, and pathology of the nervous system seemed to be needed. A committee, consisting of Sir James Crichton-Browne, Sir John Bucknill, Dr. Hughlings Jackson, and himself, resolved to establish such a journal, and selected the title *Brain*—a title which was warmly approved by Charcot, among others. It was to be managed by the committee, and edited in alternate years by Crichton-Browne and Ferrier. The first number was issued in April, 1878, and this rather unusual, and to the committee rather expensive, arrangement as to the editing continued for five years. Then with Volume VIII Dr. de Watteville became acting editor, working under the Editorial Committee, to which Dr. James Ross of Manchester and subsequently Dr. T. Buzzard were added. In 1888 *Brain* became, with Volume X, the journal of the newly founded Neurological Society, but retained its title and editor. When Dr. de Watteville

retired and went to live in Switzerland Dr. Percy Smith succeeded him, and was remarkably successful in relieving the financial difficulties under which *Brain* had always labored. When he handed it over to Dr. Head, in 1905, the journal was free from debt, and the high scientific reputation it had from the first enjoyed had since then been not only maintained but greatly enhanced, both by what may truly be termed the epoch-making studies in neurology by Dr. Head himself and by the many valuable papers which he had secured to the journal from contributors both at home and abroad. English neurologists had good reason to be proud of the position which *Brain* occupied in the world of neurology. Dr. Head's resignation of the editorship was a great loss, but they had the consolation of knowing that his mantle had fallen on one who would prove himself well worthy to wear it—Dr. Gordon Holmes.

Dr. Henry Head, in responding, said that *Brain*, after its foundation in 1878, had a severe struggle for life and suffered from a constant deficit, which was defrayed from the pockets of the editors. It was while Dr. de Watteville was editor that *Brain*, in 1888, became the organ of the Neurological Society, and its position from that time forward ought to have been secured. Unfortunately, although the published papers grew in value expenses also increased out of due proportion. When Dr. Percy Smith took over the editorship of the journal it was saddled with a large debt, and there were no assets but the annual subscriptions from the Neurological Society, which were insufficient to meet current expenses. By rigid economy and the strictest attention to finance Dr. Percy Smith succeeded in producing a condition of solvency. "I am delighted," Dr. Head continued, "to see him here tonight, for had it not been for his devotion there would have been no journal today. When I took it over from his hands it was free from debt, but there is no security in this mutable world, and within two years we were faced with the amalgamation of the Neurological Society into the corporate body of the Royal Society of Medicine. This was in 1907; it meant the cessation of all obligatory contributions, and *Brain* was thrown on to the world to sink or swim on its own merits. Guarantors came forward; the form of the journal was changed so as to improve the character of the page, a new font of type was cast, and each volume was issued at 14s., which was then considered a fair price. Subscriptions flowed in to make up the deficit due to the loss of members of the Neurological Society, and I am proud to say that the guarantors have never been called upon to contribute a penny. The next crisis came with the outbreak of war; in 1915 contributions ceased; I was almost in despair. But during the early days of the war I had been reading Dr. Hughlings Jackson's papers on aphasia, and was so struck with the way in which they had been lost to science that I reissued them as a double number of the journal. I received letters from all parts of the world about them, and v. Monakow not only translated them into French but devoted a large issue of the *Schweizer Archiv* to a critical consideration of Jackson's views, which were entirely unknown on the Continent. Then Sir Charles

Sherrington came forward with his classic paper on 'Postural Activity of Muscle and Nerve,' which has had so profound an influence on English neurology, and we were saved. The issue of the journal might be delayed, but every year of the war a volume appeared and the character of the papers retained a high standard. Then suddenly we woke up to the danger produced by the colossal rise in the price of paper and the treble increase in wages. In 1916 we were a paying concern, but in 1917 with the same number of pages we were in debt. Drastic measures were taken and we pulled through. Finally, by the end of the last financial year (June, 1921), we had paid off our debt without touching capital and were again making a profit. Moreover, our subscribers had increased, in spite of the rise in the subscription to 24s. a volume. Through all of these changes and chances, I have had the unvarying support of the committee of guarantors, and I cannot find words adequate to express to them my thanks. A united country can present a firm front to adversity and is able to make itself felt in the comity of nations. This we have done. For *Brain* has become an international organ of neurology. It is universally taken to represent the serious side of English work. To be truly international it is necessary to be at the same time national. The Continent wants no pale reflection of itself. English neurology has influenced foreign thought because it has brought into knowledge something distinctive. It has been characterized throughout by two features—its dependence on clinical observation and its consistency in looking at pathological facts from the physiological point of view. There is no doubt that this began in 1859, when Brown-Séquard was appointed to the National Hospital, Queen Square. Hughlings Jackson was profoundly influenced by that adventurous genius, more perhaps through intercourse with his famulus Victor Bazire than by direct contact with Brown-Séquard himself. The next most serious influence to which English neurology has been exposed was the publication in 1906 by their chairman of the 'Integrative Action of the Nervous System.' This reinforced the tendency, always present, to regard pathological facts from a physiological standpoint, a principle still incompletely assimilated by our colleagues abroad. Thus, with every number of *Brain* issued from the press it becomes more and more obvious that we have a message for the world. We can hold up our heads and speak with the enemy in the gate. It is our business, therefore, to raise our journal to the highest pitch of efficiency as the expression of English neurology. This is the task for the younger men, and I rejoice to think that it has passed into the competent hands of Dr. Gordon Holmes. As an old captain I can take my leave with a certainty that the ship will make voyages into fresh lands and carry fruitful cargoes to the greater glory of that branch of science we all have so truly at heart."

The health of the chairman was proposed by Sir Walter Fletcher and briefly acknowledged by Sir Charles Sherrington. The guests, who numbered between forty and fifty, took opportunity after the dinner informally to thank Dr. James Taylor, who made the arrangements. [Br. M. J.]

OBITUARY

W. H. R. RIVERS, M.D., D.Sc., F.R.S.

FELLOW AND PRAELECTOR IN NATURAL SCIENCES, ST. JOHN'S COLLEGE,
CAMBRIDGE

Dr. W. H. R. Rivers was taken suddenly ill early on Whit-Sunday, June 4, 1922, with symptoms indicative of an acute abdominal lesion and died the same evening. He had attained great distinction as an anthropologist and experimental psychologist, and had recently been accepted as the candidate of the Labor party for the representation of the University of London in the House of Commons.

William Halse Rivers was born in 1864; he went to Tonbridge School and was a student of St. Bartholomew's Hospital; he graduated M.B. London in 1886, and M.D. of the same university in 1888. His work was recognized by the honorary degrees of LL.D. of St. Andrews and D.Sc. of the University of Manchester, and in 1898 when he became a Fellow of St. John's College he was made M.A. *honoris causâ in the University of Cambridge*. He became a Fellow of the Royal College of Physicians of London in 1899, gave the Croonian lectures on the Action of Drugs and Fatigue in 1906, and in 1915-16 two courses of FitzPatrick lectures on Medicine, Magic, and Religion.

It was as an anthropologist that his name first became known. He was a member of the Cambridge expedition to Torres Strait, and in addition to contributions to the reports of that expedition wrote on the history of Melanesian society, on kinship and social organization, and on dreams and primitive culture. He was President of the Royal Anthropological Institute and of the Folk-Lore Society.

At an early stage of his career Rivers had been house physician to the National Hospital for the Paralyzed and Epileptic, and was afterwards lecturer on psychology at Guy's Hospital, as well as lecturer on physiological and experimental psychology in the University of Cambridge. In physiological investigations he was one of a company of workers long associated with Dr. Henry Head, and the results of their researches were recorded in the series of papers on the structure and functions of the afferent nervous system published in *Brain* during the first decade of this century. During the war he held the temporary rank of captain R.A.M.C., was medical officer to the Craiglockhart War Hospital and the Military Hospital, Maghull,

and psychologist to the Central Hospital, R.A.F. He thus maintained continuously his interest in psychology as well as in anthropology, and his friends were greatly impressed with the enthusiasm with which he turned from his more academic studies to clinical work in the branch of practical medicine that specially appealed to him.

His chief contribution to medicine was his remarkable book on *Instinct and the Unconscious*, first published in 1920, and described in its subtitle as "a contribution to a biological theory of the psychoneuroses"; in reviewing it shortly afterwards, the *British Medical Journal* said that it opened up new lines of thought and would well repay the most careful study. A second edition of this book was published only a few months ago; in preparing it he made some alterations in the original text, mainly in connection with the subject of dissociation, and added a couple of papers he had published in the interval. The object with which he wrote the monograph was to correlate the psychoneuroses with the concepts concerning the activities of the mind and nervous system held by biologists and physiologists. In the present highly specialized state of knowledge this is a difficult task, for it demands an expert acquaintance with branches of science seldom satisfactorily covered by one man. By this physiological work, his exceptional knowledge of psychology, especially of the more primitive races of mankind, by his considerable experience of the treatment of war psychoneuroses, and more particularly by his broad outlook, Dr. Rivers was eminently fitted to harmonize the facts of clinical psychology with the principles of biology and physiology. While not a blind follower of Freud he was able to grasp the good points in the Viennese professor's work. He regarded many of the mechanisms suggested by Freud as well adapted to explain how the conditions underlying a morbid state produce the symptoms through which the state becomes obvious. As the psychoneuroses depend essentially upon the activity of processes not ordinarily entering into consciousness, he devoted particular consideration to the general biological function of the process whereby experience passes into the region of the unconscious. Thus he illustrated the significance of repression of psychological experience by a discussion of the phenomena of protopathic and epicritic sensation, as worked out in conjunction with Dr. Henry Head, of the relation between the optic thalamus and the cortex, and of the mass reflex. The ability with which this was elaborated was remarkable. The distinction between suppression and dissociation is made clear, and the significance of the term as used in psychology, where it is so firmly.

and appropriately established, and in physiology by Drs. H. Head and G. Riddoch, leads to the suggestion that some other word should be found for the process so essential to the method by which such momentous contributions are being made to the physiology of the nervous system.

Psychological dissolution is defined as the process which experience undergoes when it is suppressed and acquires an independent activity and consciousness, as in a fugue. Repression often exists without anything that can be called dissociation, and when there is definite activity of the repressed content evidence of consciousness accompanying this activity, but cut off from the general body of consciousness, is absent. The biological need for the presence of dissociation among the potentialities of human behavior is then discussed, and it is pointed out that regression corresponds closely with the process called devolution by Hughlings Jackson, who argued that in disease the organism tends to retrace the steps of its development. Thus hysteria, which is a protective mechanism, represents a recrudescence of the reaction to danger in an early stage of animal development. In anxiety- and compulsion-neuroses, the regression is characterized by the emotional disturbance natural in childhood; and mania is regression to an extremely primitive state, but is complicated by disorder and disintegration, and so this feature is less obvious than in the milder forms of psychosis and in the psychoneuroses.

Dr. Rivers's contributions to science covered a wide field and always bore the mark of distinction, but to medical men this work will long remain the most familiar milestone.

The withdrawal of Dr. Rivers's influence at this moment is a very great loss to practical medicine as well as to science. By the width of his knowledge and the sobriety of his judgment in general psychology, informed as it was by a profound acquaintance with anthropology, he had already illuminated many dark places in psychological medicine, and the medical world was looking forward to his guidance in the future.

The funeral service was celebrated at St. John's College Chapel on June 7th.

B. M. J., June 10, 1922.

N. B.—All business communications should be made to *Journal of Nervous and Mental Disease*, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

The Journal OF Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

SPINAL DRAINAGE FOLLOWING INTRAVENOUS ARSPHENAMINE*

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The cerebrospinal fluid is a derivative of the blood plasma. "It is not an ordinary filtrate, such as lymph, since it is almost free from proteins, in health."¹ Because of this, McClendon² called it an "ultrafiltrate" of the blood, as microscopic colloid particles are restrained from entering the cerebrospinal fluid. The transudation occurs almost wholly in the choroid plexuses of the fourth, third and lateral ventricles of the brain.³ In health, this fluid is a watery solution of inorganic salts similar to those of the blood plasma, with a trace of coagulable protein and glucose, and has a specific gravity of 1.0075.⁴ The dialysing membrane, the choroid plexus, consists of the capillary wall and a layer of ependymal cells. It has a peculiarly selective activity, and to foreign chemicals in the blood it is impermeable under ordinary conditions, chloroform and hexamethylenamine being the only consistent exceptions yet determined.

Because of this physiological obstacle the attempt to treat syphilis of the central nervous system with maximum effect by the introduction of medication into the blood would seem to be hopelessly blocked. Indeed, the investigations of numerous workers to determine the presence of arsenic in the spinal fluid after intravenous injection of arspenamine would seem to further this conclusion.

* From the N. Y. Neurological Institute.

Sicard and Block⁵ recovered arsenic from the spinal fluid in three of ten cases after intravenous arsphenamine. Camp⁶ found a questionable trace of arsenic in one of seventeen cases in spinal fluid removed from fifteen minutes to fourteen hours after intravenous arsphenamine. Ravaut⁷ discovered arsenic in the spinal fluid of six of thirty-three cases treated with arsphenamine intravenously. Benedict⁸ detected arsenic in the spinal fluid of four of a large series of cases similarly treated by Sachs, Straus and Kaliski. Engman, Buhman, Gorham and Davis⁹ report four cases of general paresis treated intravenously with 0.9 grams of neoarsphenamine and negative results in tests for arsenic in the spinal fluid in all. Hall¹⁰ reports two positive findings of arsenic in the spinal fluid out of eight cases treated intravenously with the arsenical preparations. Hall administered to a series of seven cases by the Ravaut intraspinal method, 3 mgm. of arsphenamine, and later tested the spinal fluid for arsenic. After ten hours he found it present in four cases and absent in three. In another series of ten cases similarly treated the fluid was removed after twenty-four hours, and he found it present in one case and absent in nine.

Of 123 spinal fluids examined by Rieger and Solomon,¹¹ following intravenous administration of arsphenamine, 38 showed appreciable amounts of arsenic, the maximum number of positive findings and the maximum concentration being one hour after injection. Findings before one half hour were negative. These writers remark that "in general, those patients consistently showing the larger amounts of arsenic in their fluids made the more rapid improvement." The clinical findings of Rieger and Solomon¹¹ on the rapid removal of arsenic from the spinal fluid after intravenous arsphenamine, and of Hall,¹⁰ after intraspinal administration of arsphenamine, correspond with the experimental work done on the introduction of chemicals into the spinal canal. They are taken up by the arachnoidal villi and rather rapidly removed through the venous channels of the dura.¹²

A certain small percentage of the cases of syphilis of the nervous system are unquestionably benefited by the intraspinal method of administration. We have used this method for a period of years, and it is doubtful that the spirochaeticidal power of the arsenic thus applied is the sole cause of the improvement. It may act as a local irritant, rousing the sluggish forces of nature to combat, or it may be that the withdrawal of the spinal fluid is a factor, permitting a fresh supply of new fluid to escape from the choroid plexus into the containing cavities of the cerebrospinal fluid. The rather exacting technical difficulties involved in the intraspinal method are disadvantageous to the physician, but are inconsiderable compared with the root-pains, sometimes inaugurated in the patient, which can be

likened only to the severest pains of tabetic crises, and because of them many patients are deterred from continuing treatment.

Investigations concerning the removal of chemicals from the arachnoid space as performed with phenolsulphonephthalein show that when injected into the lumbar space it appears in the urine in from four to ten minutes in health¹³ and from twelve to sixty-eight minutes in paresis, and from twenty-five to one hundred and four minutes in catatonic dementia praecox.¹⁴

From their work with phenolsulphonephthalein in hydrocephalus, Dandy and Blackfan¹⁶ conclude that the spinal fluid passed directly into the blood. The dye appeared in the blood in three minutes and in the urine in six minutes following introduction into the lumbar subarachnoid space. They state that the dye appeared in the cerebral ventricles within a few minutes. This observation could not be confirmed by Weston,¹⁴ who found that the dye was not found in fluid drawn from the cisterna magna at any time up to five hours after it had been injected into the lumbar subarachnoid space. The absorption of the dye took place from the lumbar region. He further found that in recent cadavers immediately after death no dye was recoverable from the thoracic region of the spinal canal after introduction into the lumbar space.

So it would seem that, at best, the introduction of the existing arsenical preparations into the lumbar subarachnoid space is merely a local application to the adjacent structures, and is in no sense applicable as a therapeutic measure to disease of the cord higher up or of the brain. It is physiologically unscientific.

Dercum¹⁵ states that simple drainage alone done by Gilpin and Earley produced "striking results." "Marked improvement followed, an improvement which was more pronounced than that observed in the Swift-Ellis method, doubtless because the drainage was more thorough." Again, "in a number of cases we have practiced drainage alone, and always with improvement." No case records are cited. Be that as it may, in 1915 Fisher,¹⁶ and later Barbat,¹⁷ suggested drainage of the spinal canal following the intravenous injection of arsphenamine in the treatment of syphilis of the nervous system.

It seems highly desirable, if possible, to create an increased concentration of the spirochaeticidal remedy in the cerebrospinal fluid in view of the "canalicular system" which Mott¹⁸ describes as "surrounding the cells and vessels of the brain" and "in direct communication with the subarachnoid space." By the withdrawal of spinal fluid a deficiency of fluid and lowered pressure is created in the containing cavities, thereby stimulating the choroid plexus to replace from the blood the deficit. Now, if, at the time of this activity, the blood in the plexus is charged with medication, the probability of

some of it being carried over into the cerebrospinal fluid would seem to be enhanced. Further, it would seem logical that a greater quantity of medication would be transferred, than under ordinary conditions when the arachnoid of the spinal tube is distended at all points with the normal amount of fluid.

Gilpin and Earley¹⁹ published in 1916 an article with report of three cases, two of which had been drained seven times and one case six times, with fair success. In 1918, Barbat²⁰ reported that by withdrawing all the fluid that would run from a lumbar puncture, within twenty minutes after intravenous arsphenamine, he could find arsenic in the spinal fluid of twenty-five out of twenty-six cases the following day. This percentage of positive findings of arsenic in the spinal fluid is far in excess of those of the investigators who withdrew small amounts of fluid. A recent article in which the average number of spinal drainages per case was five, the authors admit, is not conclusive.²¹ Such a limited number of treatments with arsphenamine by any method is inconclusive.

Under abnormal conditions all are familiar with the saturation in a few hours of large dressings, following wounds penetrating the cranial meninges. An attempt to estimate the amount of spinal fluid poured out in twenty-four hours, following a shell-fragment puncture of the meninges, showed an average of 150 c.c.²² Numerous observations particularly common to the neurological surgeon establish the existence of a capacity to produce cerebrospinal fluid in considerable quantity and rather rapidly. That the spinal tube is refilled overnight after drainage of 50 to 80 c.c. is reasonable to suppose, as no deleterious effects are produced. Curiously enough, headache which may follow the withdrawal of 10 c.c. has been less frequent in our experience after complete drainage. The patient is, of course, kept in bed for twenty-four hours following the puncture.

Since the arsenic of arsphenamine becomes rapidly fixed in the body cells following injection into the blood stream, it was thought desirable to initiate the increased flow of cerebrospinal fluid while the maximum amount of arsenic was in solution in the blood. This period would be immediately after the intravenous injection. For Adler and Wetmore²³ found, following the administration of 0.6 gm. of arsphenamine intravenously, that 80 per cent had disappeared from the blood stream in one hour and 98 per cent in three hours, and that the concentration, then, was 0.25 to 0.50 mgm. per c.c. Therefore, as soon as the arsphenamine solution had been introduced into one of the veins of the arm, the patient rolled over on his side and a lumbar puncture was done immediately. All lumbar punctures were done with the patient lying on the side. All the spinal fluid that would run out was withdrawn, until it began to drip very slowly, five or six drops per minute. It rarely ceased to drop

entirely. The amount collected varied greatly with the same individual, the minimum being 15 c.c. and the maximum 80 c.c.

The blood and spinal fluid analyses were done in the laboratory of the Neurological Institute under the direction of Dr. O. S. Hillman, and the personal factor was constant, as all analyses were done by Miss Ruth Shivitz, to both of whom we are deeply indebted.*

The laboratory methods were as follows: Both with the blood serum and cerebrospinal fluid, two antigens, namely, crude alcoholic and cholestrinized, guinea pig heart were used. Fixation was done by the ice box method for four hours. Amboceptor was titrated against complement, and sensitized cells were used. No difference was noted in the cerebrospinal fluid reaction to the two antigens.

Globulin was estimated by the following method: 0.5 c.c. of spinal fluid was boiled with three drops of 5 per cent butyric acid. This was stratified upon 0.5 c.c. of saturated neutral ammonium sulphate solution and the tube allowed to stand a half hour before reading.

Cells were counted in the Fuchs-Rosenthal counting chamber with Nonne's cerebrospinal fluid strain.

The standard method of preparing colloidal gold was followed.

Of twenty-five cases of syphilis of the nervous system treated with intravenous arsphenamine followed by spinal drainage, those to be reported are typical examples. The average case of cerebrospinal syphilis responds so readily to simple intravenous treatment that it is rarely necessary to institute drainage. For this reason only tabetic and paretic cases are cited.

Case No. 1. Diagnosis, Tabes Dorsalis. April, 1920. Female, 46 years old, married. She had married at 18 years and had one miscarriage; divorced her husband after eighteen months because of dissolute character, and remarried four years ago.

The onset of the present illness four years ago was marked by indistinctness of vision, general weakness, and gradual loss of weight. At present, the patient complains of weakness and shakiness of legs, sharp shooting pains in the legs, staggering, inability to climb stairs, numbness and stiffness in the feet, girdle sensation, constipation and dysuria. She is unable to walk alone, but uses a cane and is supported on the one side by her sister and on the other by her husband. The gait is markedly ataxic. There is a slight internal squint of both eyes and the pupils are of pinpoint size and fixed. The finger-nose test displays moderate ataxia and the heel-knee test very marked ataxia. The knee and ankle jerks are gone, and the muscle-joint sense in the toes is greatly disturbed.

* We wish to thank Dr. E. G. Zabriskie for permission to use such clinical material on his service, as we desired, also Dr. C. Lester Wood, and Dr. Patrick M. Carroll for assistance in carrying out the treatments.

Treatment and serology follow:

1920	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
Apr. 23	0.6	40	4+	4+	4+	2+	44	1+
Apr. 30	0.6	15	4+	4+	4+	2+	13	1+
May 7	0.6	15		4+	4+	2+	12	1+
May 14	0.6	50		4+	4+	2+	13	3+
May 19	0.6	45		4+	3+	1+	10	2+
May 26	0.6	35		4+	3+	2+	8	2+
June 9	0.6	50		4+	3+	1+	3	1+
July 2	0.6	50		4+	3+	1+	3	1+
July 14	0.6	35		4+	2+	2+	3	—
July 22	0.6	40		4+	2+	1+	2	1+
July 28	0.6	35		4+	2+	1+	0	1+
Aug. 5	0.6	45	—	4+	4+	1+	0	1+
Oct. 15	0.6	50	—	3+	2+	1+	0	1+
Oct. 29	0.6	50		3+	1+	1+	0	1+
Nov. 5	0.6	50		4+	2+	1+	0	1+
Nov. 12	0.6	50		3+	1+	1+	0	1+
Nov. 26	0.6	60		3+	1+	1+	4	1+
Dec. 3	0.6	40		1+	—	—	0	1+
Dec. 10	0.6	50		2+	1+	—	3	1+
Dec. 17	0.6	50		2+	—	—	4	1+
Jan. 28	0.6	50	—	1+	—	—	3	1+

Aug. 5, 1920, Gold, Sol., IIIII000000.

January, 1921. The patient has been practically transformed. She has gained 21 pounds in weight, now weighing 153 pounds. Whereas she was a dependent invalid, she now does all her own housework, marketing and shopping alone in any part of the city, mounting and descending the elevated and subway stairs and getting on and off buses. She is free from pain, but has paresthesia in the feet at times. The pupillary, ocular and tendon reflex signs are unchanged. The ataxia of the upper extremities is almost nil and has so ameliorated in the lower extremities that she can walk a straight line with only rare evidence of ataxia and Romberg's sign is scarcely perceptible.

Case No. 2. Diagnosis, *Tabes Dorsalis*. April, 1920. T. R. Q., male, 41 years old, married. Patient had a chancre fifteen years ago. For two years the patient has suffered from numbness in the feet, more marked in the left, urinary urgency, and attacks of stabbing pains in the legs and thighs and pectoral region, so severe, of late, as to prevent sleep. The pupils are unequal and react to light fairly promptly. The tendon reflexes at the knees and ankles are absent. The gait is ataxic and Romberg's sign is positive. Tests of sense of position in the upper and lower extremities are inaccurately performed. The patient has a mild aortic insufficiency.

April, 1921. The patient is working as an automobile salesman and is quite active. There is a slight residual ataxia evident in an occasional slight misstep with the left foot. Station is more secure. The reflex signs, tendon and pupillary, are unchanged. Aortic signs

still present. Health and sense of well-being have improved. His appearance is much improved. Rarely he suffers from leg pains. The numbness in the left foot persists.

Treatment and serology follow:

1920	C. S. Fluid			Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	C. S. F. 2 c.c.	1 c.c.	0.4 c.c.		
Apr. 23	0.4	40	4+	4+	4+	4+	40	1+
Apr. 28	0.4	60		4+	4+	3+	80	±
May 7	0.4	40		4+	4+	4+	24	—
May 12	0.4	50	4+	4+	3+	2+	8	1+
May 19	0.4	40					29	1+
May 28	0.4	70		4+	3+	2+	11	1+
June 6	0.4	70					6	1+
June 13	0.4	45		4+	2+	1+	3	1+
1921								
Feb. 19	0.4	40		3+	1+	1+	8	1+
Feb. 26	0.4	40						
Mar. 24	0.4	40		2+	1+	1+	3	—

Case No. 3. Diagnosis, *Tabes Dorsalis*. July, 1920. R. T., male, 46 years old, married. Chancre twenty-three years ago treated locally. Onset of late symptoms, four years ago, was characterized by diplopia and leg pains. Recently he began to stagger and the legs became so weak that he was compelled to give up work. Disorder of urinary control has developed. The patient presents Argyll-Robertson pupils, absent knee and ankle jerks, ataxic gait and slight hypotonia of the knees.

December, 1920. Between July and December, 1920, the patient received six intravenous and three intraspinal arsphenamine treatments. A certain amount of improvement followed, but the patient walks very feebly and with great uncertainty, and only by the aid of two canes.

Treatment and serology were as follows:

1920	C. S. Fluid			Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	C. S. F. 2 c.c.	1 c.c.	0.4 c.c.		
Dec. 10	0.6	40	4+	4+	4+	4+	2	1+
Dec. 17	0.6	50						
Dec. 21	0.6	40		4+	2+	1+	3	1+
1921								
Jan. 11	0.6	40		4+	4+	3+	0	1+
Jan. 21	0.6	40		4+	4+	2+	3	—
Feb. 1	0.6	30		4+	2+	1+	3	1+
Feb. 12	0.6	40		4+	4+	2+	3	—
Feb. 26	0.6	30		4+	3+	1+	0	1+
Mar. 11	0.6	40		4+	2+	1+	4	1+
Mar. 25	0.6	50	2+	4+	2+	1+	0	±
Apr. 8	0.6							
Apr. 26	0.6	40		2+	1+	1+	3	1+
May 14	0.6	40		4+	2+	1+	0	1+
May 28	0.6	40		3+	1+	—	0	1+
May 14.	Gold Sol., 5524331100.							

May, 1921. The patient's improvement has been very gradual. He has gained thirty pounds in weight since December. In walking he now uses but one cane, and can go up and down stairs. He still makes an occasional uncertain step. Strength has greatly improved. Recently he walked a mile and a half. Urinary control is now normal. The hypotonus of the knees is less evident. The reflex signs are unchanged.

Case No. 4. Diagnosis, Tabes Dorsalis. March, 1920. C. G., male, 36 years old, married. The patient denies having a chancre, but admitted having gonorrhoea one year prior to marriage, fifteen years ago. His wife had no pregnancy. The onset of present illness, two months ago, was ushered in with urinary retention, staggering gait, pressure in abdomen and "general nervousness."

Recently he has had shooting pains in the legs, urgency of urination, and failing sexual potency. The patient presents decided insecurity in the Romberg position, ataxic gait, moderate incoördination in finger to nose and heel to knee tests, and absent knee and ankle jerks. The pupils are irregular, the right is sluggish and left does not respond to light.

Treatment and serology were as follows:

1920	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
Apr. 14	0.6	45	4+	4+	4+	4+	296	1+
Apr. 24	0.6	50		4+	4+	2+	109	1+
Apr. 30	0.6	40	4+	4+	3+	2+	40	1+
May 6	0.6	30	4+	4+	3+	2+	76	1+
May 11	0.6	45	2+	4+	2+	1+	51	1+
May 18	0.6	30		4+	4+	2+	55	1+
Oct. 1	0.6	30		4+	4+	2+	28	1+
Oct. 5	0.6	50		4+	2+	1+	0	1+
Apr. 14, 1920.	Gold Sol., 255554310							

June, 1920. Patient shows marked improvement in gait and station. He can run up stairs. He can also use the pedals of an auto.

November, 1920. The patient shows continued improvement. He has complete control of the sphincters. He can almost succeed in walking a straight line, but missteps occasionally. There is moderate swaying in Romberg position. The finger to nose test is accurate. The reflexes remain unchanged. He has been able to keep at his work as a chauffeur, working ten hours a day.

Case No. 5. Diagnosis, Tabes Dorsalis. March, 1920. H. C., male, 39 years old, married. Venereal infection is denied. The onset of the present illness, two years ago, was marked by lightning pains, dimness of vision, and impotence. He now complains of occasional pains in the legs, slight unsteadiness in walking and numbness in the feet.

Physical examination reveals irregular, fixed pupils, slight temporal pallor of the discs, absent knee and ankle jerks, and very slight unsteadiness in the Romberg station. No other ataxia can be demonstrated. To date the patient has received thirty intravenous treatments of arsphenamine, with a certain amount of improvement but without change in the serology.

Treatment and serology were as follows:

	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with-drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
1920								
Apr. 2	0.6	20	1+	4+	4+	4+	46	2+
Apr. 16	0.6	40		4+	4+	1+	24	1+
Apr. 25	0.6	25		3+	2+	1+	10	1+
July 1	0.6	60		2+	2+	1+	16	—
July 8	0.6	50	—	3+	2+	1+	8	1+
July 15	0.6	50		2+	1+	—	6	—
July 22	0.6	45		1+	1+	1+	5	—
Aug. 5	0.6	65		1+	—	—	0	—
Nov. 1	0.6	35	—	—	—	—	0	—
1921								
Feb. 10	0.75	45	—	—	—	—	0	—

February, 1921. The patient is quite recovered. He is without complaint. This is not a euphoric state, as he is leading a very active life. Among other activities he plays several sets of tennis twice a week. Physical signs are the same as one year ago.

Case No. 6. Diagnosis, *Tabes Dorsalis*. March, 1920. M. H., male, 32 years old, single. Syphilis is denied; gonorrhea is admitted ten years ago.

The onset of the present illness, two years ago, was marked by pain in the legs, unsteadiness in walking and standing, failing sexual power, and double vision. There was gradual increase in all the symptoms to such an extent that he is unable to walk unsupported. He is unable to get up and down stairs, is incontinent of urine, is impotent, suffers sharp pains in legs, has a girdle sensation and has drooping of the right eyelid.

Examination shows marked ataxia and incoördination of all the extremities. The patient is unable to stand with the eyes closed even when feet are widely separated. He is unable to walk twenty-five feet and keep in a path a yard wide. In the finger-to-nose test there is extreme ataxia and dysmetria. He often misses the face entirely when trying to touch the nose. He is equally as ataxic in the lower extremities. The knee and ankle jerks are absent and there is loss of postural and vibratory sense in the toes and feet. Argyll-Robertson pupils and partial paralysis of right third and left sixth cranial nerves are present.

Treatment and serology were as follows:

1920	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
Apr. 9	0.6	40	4+	4+	4+	4+	73	3+
Apr. 16	0.6	20		4+	4+	4+	44	2+
Apr. 23	0.6	30		4+	4+	4+	33	1+
Apr. 30	0.6	40		4+	3+	2+	6	1+
May 7	0.6	25		4+	4+	2+	9	1+
May 18	0.6	30		4+	4+	2+	8	3+
May 21	0.6	15		4+	4+	2+	8	1+
May 28	0.6	30		4+	2+	1+	6	1+
June 22	0.6	40		4+	3+	1+	4	1+
June 29	0.6	40		4+	2+	1+	14	2+
July 2	0.6	25		4+	3+	1+	0	1+
July 7	0.6	30		4+	3+	1+	0	1+
July 20	0.6	20		3+	1+	—	2	1+
July 30	0.6	40		4+	2+	1+	R.B.C.	1+
Aug. 3	0.6	25	4+	4+	4+	2+	2	1+
Sept. 28	0.6	30		4+	4+	3+	38	1+
Oct. 4	0.6	25		4+	4+	4+	12	++
Oct. 11	0.6	35		4+	4+	2+	6	1+
Oct. 18	0.6	35	4+	4+	4+	4+	3	1+
Oct. 25	0.6	30		4+	4+	4+	4	1+
Oct. 31	0.6	40		4+	4+	4+	6	1+
1921								
Feb. 1	0.6	45		4+	4	4+	108	2+
Feb. 8	0.6	30		4+	4+	4+	21	2+
Feb. 15	0.6	40		4+	4+	4+	36	1+
Mar. 1	0.6	35		4+	4+	2+	13	1+
Mar. 8	0.6	30		4+	4+	2+	6	1+
Mar. 15	0.6	45	4+	4+	4+	2+	17	1+

Wide variations in the colloidal gold curve, have been noted in numerous cases, during treatment. As an example of this variation, that of this case is cited below. The significance of this variable chemical reaction is not obvious.

Apr. 9, 1920. 4554332200; Apr. 30, 1920. 1112221000; May 18, 1920. 1222110000; June 22, 1920. 1122110000; June 29, 1920. 2434321110; July 2, 1920. 1111100000; June 1, 1921. 2233311000.

June, 1920. The patient has improved in many respects. The gait is more secure, but still ataxic. The flail-like swinging of left leg has practically ceased. The finger-to-nose test is executed with only slight dysmetria and ataxia, whereas there was formerly an inaccuracy from three to five inches. There is still ptosis of right eyelid and weakness of left external rectus, some wobbling on the heel-to-knee test, positive Romberg sign and slight loss of postural sense in both great toes. The reflexes are unchanged.

March, 1921. There has been progressive improvement since treatment began, one year ago. The patient has been steadily at work for some months, and has little difficulty in walking. He is free from pain except at rare intervals. When pain recurs it is very slight. Examination now shows ability to stand in the Romberg position with eyes closed, but with considerable swaying. The gait shows only slight ataxia. The finger-to-nose and heel-to-knee tests are executed almost perfectly. The ptosis of the right eyelid

has disappeared, but there is slight paresis of left external rectus. Sensation is normal. The Argyll-Robertson pupils and absent knee and ankle jerks are unchanged.

Case No. 7. Diagnosis, *Tabes Dorsalis*. August, 1919. A. R., male, 39 years old, married. Patient suffered a chancre twenty years ago, for which he took mercury and iodides for two years. He remained well until September, 1918, when he began having pains and stiffness in right knee and left arm, stabbing pain in muscles of legs and unsteadiness in walking. The symptoms grew gradually worse during the past year. No sphincter disorder or loss of sexual power was complained of.

The patient presents the following signs: ataxic station and gait; absent knee and ankle jerks; unequal, irregular and sluggish pupils; pedal incoördination; loss of postural sense in toes, and hypalgesia in radicular areas in the legs. Prior to drainage the patient had received sixteen intravenous treatments.

Treatment and serology were as follows:

	C. S. Fluid			C. S. F.			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
1920								
Mar. 15	0.6	40	—	4+	4+	4+	152	3+
Mar. 22	0.6	30						
Mar. 29	0.6	50		4+	3+	2+	56	1+
Apr. 8	0.6	20		2+	1+	—	11	—
June 2	0.6	30		2+	2+	1+	11	—
June 9	0.6	60		3+	1+	1+	32	1+
1921								
Mar. 29	0.6	30		4+	2+	1+	0	±
Mar. 15, 1921.	Gold Sol., 1224333300.							

June, 1920. The patient has been at work six weeks as a mechanic and feels quite well. He has an occasional pain with change of weather. The insecure station and ataxic gait have disappeared, and sensory examination shows only slight postural disorder in toes. The reflexes and pupils remain as first noted.

February, 1921. The patient remained well until a few weeks ago, when he noticed a return of pain in the legs. This disappeared after a dose of calomel. The only treatment since June, 1920, has been thirty mercurial rubs. No objective sensory disorder can be demonstrated; otherwise the examination is the same as noted in June, 1920.

Case No. 8. Diagnosis, *Tabes Dorsalis*. September, 1920. A. S., male, 35 years old, married. Venereal infection is denied. The duration of the present illness is about two years. He complains of difficulty in walking and "no feeling in the legs and feet." He suffers frequently with severe pains in legs, inability to hold the urine, and, at times, difficulty in starting urination.

With great difficulty the patient can walk with the aid of two

canes. The feet are lifted high and thrown forward in a flaccid ataxic gait. There is hypotonus of legs with genu recurvatum. The patient is unable to stand in the Romberg position. When attempting the heel-to-knee test he frequently lets the heel fall on the shin; then again it falls far above the patella. The knee and ankle jerks are absent. The pupils are irregular, unequal and rigid to light. Postural and vibratory sense are lost in the feet, and there is definite hypalgesia corresponding to lower lumbar and upper sacral distribution.

Treatment and serology were as follows:

1920	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
Oct. 2	0.6	15	4+	4+			13	1+
Oct. 9	0.6	30		3+			10	1+
Oct. 16	0.6	20		4+			11	1+
Oct. 23	0.6	35		4+			10	±
Oct. 30	0.6	20		2+			2	1+
Nov. 13	0.6	45		4+	3+	1+	31	2+
Nov. 20	0.6	40		3+	1+	1+	3	±
Nov. 27	0.6	40		3+	1+	1+	3	1+
Dec. 14	0.6	30		2+	1+	—	2	—
Dec. 21	0.6	45		3+	1+	1+	3	1+

December, 1920. The patient states that he has less pain and he thinks he is not so uncertain in his walking. The dead feeling in his feet has improved. Objectively no change can be noted. He is as ataxic as on previous examination. There is probably slight improvement in deep muscle and joint sensibility.

Case No. 9. Diagnosis, Tabes Dorsalis. September, 1920. W. W., male, 42 years old, married. The patient denies venereal infection. His wife has never been pregnant. The duration of the present illness is four years. The patient complains of unsteadiness and difficulty in walking. He has frequent lightning-like, stabbing pains in the arms and legs. He complains of a girdle sensation around the abdomen and inability to hold the urine.

Patient is unable to stand in the Romberg position with eyes open or closed. His gait is staggering, ataxic and on a broad base. Manual and pedal incoördination is so marked that he frequently missed his face entirely when trying to bring finger to nose, and when an attempt is made to locate the knee with the heel he misses the point from three to six inches. The deep reflexes in upper and lower extremities are abolished. There is paresis of the right sixth and left third cranial nerves. The pupils are unequal and do not react to light. Postural sense is lost in the toes and greatly diminished in ankles and knees.

The patient has received fifty intravenous treatments before drainage was instituted. Treatment and serology were as follows:

	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
1920								
Sept. 30	0.6	15		4+	4+	4+	44	2+
Oct. 7	0.6	15		4+	4+	4+	20	2+
Oct. 21	0.6	15						
Oct. 29	0.6	15		4+	4+	4+	21	2+
Nov. 4	0.6	30		4+	4+	4+	9	1+
Nov. 11	0.6	35		4+	4+	4+	5	1+
Dec. 7	0.6	30		4+	4+	4+	13	1+
Dec. 17	0.6	25		4+	4+	4+	29	1+
Dec. 24	0.6	35		4+	4+	4+	16	1+
Dec. 31	0.6	30		4+	4+	4+	8	1+
1921								
Feb. 4	0.6	15		4+	4+	4+	89	1+
Feb. 11	0.6	25		4+	4+	4+	6	1+
Feb. 18	0.6	35		4+	4+	4+	10	1+
Feb. 26	0.6	15		4+	4+	4+	16	1+
Sept. 30, 1920.	5544321000							
Feb. 18, 1921.	555543200							

December, 1920. The patient is greatly improved. He seldom has any pain. His gait is greatly improved. Paresis of the left third cranial nerve has disappeared. The right external rectus still is paretic. He has gained weight and states he can work all day as a transit man, but he cannot set his transit over the tack.

March, 1921. For the past six weeks the patient has been more uncertain in his movements. He had to give up his work as a surveyor and take an office job. He complains of pain on damp, cold days. He feels better, but there is equally as much ataxia as on first examination. The reflexes and sensations are unchanged.

Case No. 10. Diagnosis, *Tabes Dorsalis*. May, 1920. J. M., male, 48 years old, married. The patient had a chancre twenty-five years ago. His wife was never pregnant. During the present illness of seven years' duration there has been gradual progression of unsteadiness in standing and walking. He suffers from pains in legs and difficulty in urination. The examination shows marked Romberg and ataxic gait, bilateral hypotonus of legs, marked pedal incoördination, absent knee and ankle jerks and Argyll-Robertson pupils.

Treatment and serology were as follows:

	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
1920								
May 13	0.6	45	4+	4+	4+	4+	58	1+
May 21	0.6	40		4+	4+	4+	44	1+
May 27	0.6	22		4+	2+	2+	26	1+
June 4	0.6	25		4+	2+	1+	8	—
June 11	0.6	30		4+	4+	2+	0	1+
June 18	0.6	35		4+	2+	2+	6	—
July 27	0.6	25		4+	4+	2+	15	1+
Aug. 3	0.6	30		4+	2+	1+	13	1+
Aug. 10	0.6	25		4+	4+	2+	24	2+
Aug. 10.	Gold Sol., 11100000000							

January, 1921. Patient states that he feels better generally and that there is very decided decrease in the severity and frequency of pain in the legs, and that he has a sense of greater security in walking. Ataxia in gait is still obvious. The reflex and pupillary signs are unaltered.

Case No. 11. Diagnosis, *Tabo-Paresis*. May, 1920. P. C., male, 34 years, married. The patient suffered a chancre twelve years ago which was treated locally.

The present symptoms, shooting pains in the legs, difficulty in urination and muscular fatigue, were first noticed four months ago. He became irritable and excitable. Examination shows slight ataxia of gait and station; very slight incoördination of upper extremities; absent knee and ankle jerks, and Argyll-Robertson pupils.

Treatment and serology were as follows:

	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo- arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
1920								
May 25	0.6	30	1+	4+	4+	4+	31	1+
June 2	0.6	35		4+	4+	3+	33	1+
June 8	0.6	20		4+	3+	1+	22	1+
June 15	0.6	45		4+	2+	1+	11	1+
June 22	0.6	30		1+	1+	—	12	1+
June 29	0.6	35	2+	2+	1+	1+	6	1+
Sept. 28	0.6	30		4+	3+	1+	15	1+
Oct. 5	0.6	35		4+	4+	2+	15	2+
Oct. 12	0.6	30		4+	4+	2+	9	1+
Oct. 19	0.6	35		4+	4+	2+	5	1+
Oct. 26	0.6	50		4+	4+	1+	13	1+
Nov. 9	0.6	45	4+	2+	1+	—	9	1+
Nov. 16	0.6	40		3+	1+	1+	9	1+
Dec. 21			4+					
1921								
Feb. 11	0.6			4+	4+	2+	12	1+
Feb. 16	0.6	35		4+	4+	2+	8	1+
Feb. 23	0.6	45		4+	4+	4+	40	1+
Mar. 1	0.6	30		4+	4+	4+	8	1+
Mar. 11	0.6	40		4+	4+	4+	13	1+
Mar. 19	0.6	35		4+	4+	4+	4	1+
May 24	0.6	35		4+	4+	2+	3	1+
June 1	0.6	30		4+	2+	1+	5	1+

June 22, 1920. Gold Sol., 5555543210; Feb. 11, 1921. Gold Sol., 5555532110; Feb. 23, 1921. Gold Sol., 5555543110; Mar. 1, 1921. Gold Sol., 5555332100; Mar. 11, 1921. Gold Sol., 5555421100; Mar. 18, 1921. Gold Sol., 5555431000; May 5, 1921. Gold Sol., 5554311000; June 1, 1921. Gold Sol., 5555421000.

February, 1920. The patient states that the pain is greatly diminished and that control of sphincters is normal. The physical examination is as noted above, and in addition there is a very slight facial and labial tremor; memory is defective, and there is an attitude of indifference regarding his illness. He cannot repeat test phrases.

May, 1921. The condition of the patient seems stationary. He is able to conduct a small shop despite his moderate excitability and memory disorder for recent events. He cannot remember test

phrases correctly, but there is no slurring of speech. The physical signs are unaltered. The labial and lingual tremors are not always perceptible.

Case No. 12. Diagnosis, *General Paresis*. May, 1920. J. S., male, 50 years, single. Patient had a chancre in 1904. He took mercury and iodide for two years. He complains of shooting pains in arms and legs and impotence of three years' duration. He shows active knee and ankle jerks, irregular pin-point pupils, fixed to light, slurring speech, tremors of face and tongue, failing memory and poor judgment, flights of ideas and euphoria.

Treatment and serology were as follows:

1920	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
May 11	0.6	35	4+	4+	4+	4+	3	1+
May 18	0.6	25		4+	4+	2+	12	1+
May 25	0.6	30		4+	3+	2+	0	1+
June 2	0.6	40	4+	4+	4+	2+	13	1+
June 9	0.6	25		3+	3+	2+	13	1+
June 16	0.6	45		4+	4+	2+	10	1+
July 27	0.6	30		4+	3+	1+	5	1+
Aug. 10	0.6	30		4+	2+	—	8	1+
Sept. 28	0.6	25		4+	4+	2+	24	1+
Oct. 2	0.6	20	—	4+	3+	1+	12	1+
Oct. 9	0.6	20		4+	3+	1+	12	1+
Oct. 16	0.6	30		4+	2+	1+	9	1+
1921								
Feb. 4	0.6	25	1+	4+	4+	2+	22	1+
Feb. 23	0.6	40		3+	1+	1+	10	1+
Mar. 11	0.6	30	—	4+	2+	2+	25	1+

Mar. 11, 1920. Gold Sol., 1122110000; Mar. 11, 1921. Gold Sol., 3222211000.

April, 1920. The patient presents practically the same picture as on admission a year ago. He is little concerned over his illness. There is decided lack of attention and loss of insight. His speech is of parietic type. He is quiet and uncommunicative. Gradual deterioration has been evident.

Case No. 13. Diagnosis, *General Paresis*. September, 1920. C. McK., male, 44 years old, married. The patient denied having had syphilis, but admitted having had gonorrhoea some years ago. The present symptoms are of one year's duration. There has been progressive deterioration of memory and increasing irritability and impatience. Ordinarily he is quiet and taciturn, but displays periods of great excitement and anger, without cause. He has become unable to continue his occupation, playing the piano in an orchestra. He is careless in his habits and occasionally soils himself.

Examination shows a slight swaying in the Romberg position. The gait is slightly ataxic. The finger-nose and heel-knee tests are well performed. There is marked tremor of the face, tongue and hands. The knee and ankle jerks are hyperactive. The deep

reflexes in the upper extremities are active and equal. The Kleppel-Weil sign is present in both hands. No disturbance of sensation could be determined. The pupils are irregular and do not react to light. Speech is slurring and there is stumbling in test phrases. The patient is jovial and manifests a juvenile amusement at the tests. Memory for recent events is very poor. Emotional outbursts are frequent.

Treatment and serology were as follows:

1920	C. S. Fluid			C. S. F. Wassermann			Cells c.m.	Globulin Excess
	Neo-arsphen gm.	with- drawn c.c.	Serum Wasser- mann	2 c.c.	1 c.c.	0.4 c.c.		
Oct. 1	0.6	40	4+	4+	4+	4+	129	2+
Oct. 8	0.6	40		4+	4+	4+	28	2+
Oct. 15	0.6	40		4+	4+	4+	16	2+
Oct. 22	0.6	50		4+	4+	4+	16	2+
Oct. 29	0.6	30		4	4+	4+	6	2+
Nov. 5	0.6							
Nov. 12	0.6							
Nov. 26	0.6	45		4+	2+	—	4	2+
Dec. 4	0.6							
Dec. 10	0.6	35		4+	4+	2+	4	1+
Dec. 17	0.6	30		4+	4+	2+	6	2+
1921								
Jan. 7	0.6	45		2+	1+	1+	3	2+
Jan. 14	0.6	35		4+	4+	2+	3	1+
Jan. 21	0.6	35		4+	4+	2+	5	2+
Oct. 8.	Gold Sol., 5555555332							

November, 1920. The patient manifests a certain insight into his condition and expresses a degree of concern regarding it. His wife states that he is less irritable and less restless, and that he sleeps better. He is coöperative with the physician and his conduct exemplary.

January, 1921. No substantial improvement has taken place since that noted above. He is less irritable and emotionally more stable, but has deteriorated intellectually. The tremors, reflex changes and other physical signs are as originally noted.

In forming opinions concerning therapy in syphilis of the nervous system, one may expect favorable results only in cases in which disordered function is due to perivascular exudate. Where degeneration of nervous tissue has occurred, naturally no improvement will follow treatment. The majority of cases, when first applying for treatment, are pathologically of mixed type, combining exudation and parenchymatous degeneration. There is no positive clinical method of determining the degree of each state except by pushing anti-syphilitic therapy to the limit. To be sure, certain serological and physical findings are suggestive, but not absolute. General paresis and tabes dorsalis of long standing without efficient treatment present the largest proportion of parenchymatous deterioration of nervous tissue. In cerebrospinal syphilis and early tabes the exuda-

tive pathology predominates, and in them the most favorable results may be expected from treatment. It is the exudative pathological condition which may be remedied. And it is in the perivascular and perineural spaces that the cause of the exudative inflammatory reaction, the spirochaete, must be attacked. Perhaps the beneficial feature of spinal drainage is not an increased quantity of arsenic in the cerebrospinal fluid, but the fact that a lowered pressure in the cavities surrounding the central nervous system permits a dilatation of the capillaries, with consequent increase in the quantity of medication-bearing blood in the parts. For, it is in the perivascular and perineural spaces that the spirochaete must be attacked.

In many cases the serological changes do not parallel the clinical improvement. Even when the spinal fluid Wassermann is persistently fixed, progressive clinical improvement may have occurred.

As a result of this piece of clinical research, of which some of the results appear above, and our experience during the past ten years in treating syphilis of the nervous system with the various arsenical preparations by the simple intravenous administration, by the several intraspinal methods and by combinations of these with mercurial treatment, we have arrived at the following conclusions:

1. No single method of treatment is applicable to all cases.
2. The intravenous administration of arsphenamine is the method of choice.
3. Spinal drainage after intravenous administration of arsphenamine is not a hazardous procedure.
4. Drainage will benefit some cases which have arrived at a position of inertia under intravenous administration alone.
5. As satisfactory clinical and serological results may be obtained by intravenous arsphenamine and drainage as are produced by the intraspinal method and without the severe root-pains frequently set up by the latter method.

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MEMORY DEFECT OF KORSAKOFF TYPE, OBSERVED
IN MULTIPLE NEURITIS FOLLOWING TOXAEMIA
OF PREGNANCY*

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It has long been recognized that alcoholic multiple neuritis is frequently accompanied by an interesting type of psychosis which is now popularly designated as Korsakoff's psychosis. Impairment of immediate memory, mild mental clouding, confusion and fabrication, comprise the salient features of the syndrome. For a considerable period of time, after the acceptance of the Korsakoff syndrome, little reference was made in the literature to its occurrence in the multiple neuritides having their etiologic basis in toxæmias other than alcohol. Recently however, our attention has been called to the presence of memory defects associated with Carbon Monoxid poisoning, and it has been observed that not infrequently such defects have been of long duration, if not permanent in character.

Some time in April 1914, I was afforded the opportunity of examining Mrs. B. W. T. who had recently been admitted to the Iowa Methodist Hospital. Mrs. T. was at that time suffering from a well marked attack of multiple neuritis, which had followed shortly after a therapeutic abortion, necessitated by pernicious vomiting of pregnancy. In this case, aside from the ordinary polyneuritic symptoms, the point of chief clinical interest was the memory defect which she then exhibited, and which immediately made me think of its similarity to the amnesia observed in alcoholic neuritis. I was, therefore, much interested in following up the subsequent course of the malady. It did not occur to me then that such cases are relatively infrequent; therefore I had no thought of publishing a clinical report at the time the case was under observation. It was not long after however, that I saw a similar case, which also followed pernicious vomiting of pregnancy, and during the past two years two others have come to my attention.

I regret that in making this report, much of the minutiae and

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clinical detail may have to be omitted owing to the fact that three of the patients were examined during hurried consultations in the rural districts, but I trust that I shall bring out sufficient data in each case, to establish beyond a reasonable doubt, the diagnosis and the associated memory defect which makes this report justifiable.

In looking over the text books on neurology, psychiatry and obstetrics, I find few helpful references pertaining to this subject, which is frequently dismissed with a statement to the effect that multiple neuritis due to puerperal infection is an occasional complication of the puerperium. The whole subject of toxæmia of pregnancy is as yet, in a chaotic state. It is to be hoped that modern methods of research in the field of blood chemistry may clear up some of the theoretic speculation which pertains to it, but at the present time we only know positively, that certain toxins, apparently of endogenous origin, are frequently manufactured in the body of the pregnant woman and do lead to eclampsia, pernicious vomiting, and other toxic phenomena.

Before presenting my case reports I would like to refresh the reader's memory on a few points pertaining to the subject of multiple neuritis, making special reference to the so-called puerperal type, and to those forms in which marked morbid psychic phenomena have been most prone to occur. It is a well established conclusion, that focal or multiple neuritides may be caused by a great variety of infectious diseases and poisons, that the infections which are most prone to generate tenacious toxins are most frequently followed by neuritis, and then the neuritides following metallic poisoning usually manifest themselves as subacute or chronic sequelæ, no matter whether the intoxication be acute or chronic. We are much more apt to have multiple neuritis following diphtheria, scarlatina and typhoid, than we are the lighter infections observed in the more mild and evanescent exanthemata. This is undoubtedly due to the fact that in the former diseases, the nervous system is more persistently saturated with chemical poisons generated or incited by microörganism which have invaded the body. In other words, it seems apparent that the causative agents of these more grave disorders produce toxins in greater abundance, and that said toxins are more freely distributed throughout the body by way of the circulatory system and lymphatics.

Among other forms of multiple neuritis the alcoholic type has possibly afforded the greatest opportunity for clinical study, since the charity hospitals in our large cities have heretofore always har-

bored a large contingent of liquor saturated human derelicts. In 1887, Korsakoff(1) described a form of mental disturbance which he found to be a very frequent complication or symptom of alcoholic multiple neuritis. This psychosis presents as its outstanding features a defect in immediate memory, retroactive amnesia and fabrication, with almost normal retention of past memory. At the present time the literature teems with case reports confirming his observations.

Since the advent of the automobile, and the more extensive use of coal gas, quite a few cases of Korsakoff's psychosis have been reported as occurring in the carbon monoxid neuritides, and it has been observed that the defect in immediate memory in these cases has been very marked and prolonged,—so prolonged, in fact, that it is thought that in many instances it is permanent. It was not until I had the opportunity to observe the clinical course in the case of Mrs. B. W. T., whose history subsequently appears in this report as Case I, that I knew that the Korsakoff syndrome might appear in the multiple neuritides having their etiologic origin in the other forms of toxæmia.

It will be of interest to note that in a very extensive and detailed contribution to this subject by Von Hösslin,(2) the statement is made that the Korsakoff syndrome is reported as having been observed in the multiple neuritis following toxæmia of pregnancy, long before Korsakoff placed his syndrome before the scientific world. In addition to this, the same contributor states that, pro rata, the incidence of this psychosis is much more frequent in the neuritides following gestational toxæmia than in alcoholic neuritis. (The Hösslin is further responsible for the following reliable conclusions pertaining to this subject: that there is a form of multiple neuritis which takes its origin in the toxæmia of pregnancy, which is wholly independent of any infection; that this malady may have its onset either before or after delivery; that when recognized, therapeutic abortion should be resorted to; that the termination of pregnancy hastens recovery; that convalescence is protracted, it having been four years before the patellar reflexes returned in one case which came under his observation, and that isolated neuritides may occur in place of the disseminated type, their location being determined frequently by intercurrent circumstances, such as slight trauma and stretching of the nerve trunks during the violent physical activities incident to delivery, or as the result of pressure of the foetal head in the mother's pelvis. This rather lengthy reference to Von Hösslin's article is prompted by the fact that, as far as I have been able

to find, it is the most comprehensive and exhaustive treatise obtainable on this subject.

In making a study of the effect of various toxic substances on the nervous system, it has probably occurred to us all that although their baneful effect most frequently seems to confine itself to the peripheral nerves, it is reasonable to doubt whether this dividing anatomical line can safely be drawn. One has only to ponder upon the protean manifestations of Epidemic Encephalitis, the various forms of myelitis, and the nervous sequelae of the Flu, to convince himself that it is far oftener a "happen so" than otherwise, that one nervous structure becomes involved, and another remains intact. At this point the mental disorders which accompany such toxic processes as the one under consideration tend to bridge over the gap and give us a clinical foundation for the belief that in many, and possibly in all cases of profound toxæmia resulting in multiple neuritis, the central as well as the peripheral nervous structures are involved.

In two of the cases to be subsequently reported, a temporary loss of sphincter control was observed, and while this was attributed at the time to mental clouding, I have never been fully satisfied that this explanation is adequate. Then, too, in Case II, also to be subsequently reported, the muscular atrophies which were pronounced during the third month of the illness tended to be irregular in their distribution, suggesting a nuclear origin with preponderance of marked tissue reactions in certain spinal segmental areas. Apropos of this phase of the subject, we are indebted to Stuart,⁽³⁾ who, in an article entitled "Puerperal Neuritis and Poliomyelitis," recites the clinical history of a typical fatal case of multiple neuritis originating in the toxæmia of pregnancy, in which an autopsy was performed, followed by a complete systematic microscopic study of representative portions of the whole central nervous system. As a result of this investigation, it was found that, in addition to the classical changes in the nerve trunks which characterize multiple neuritis, there were also extensive degenerative changes in the posterior and lateral tracts of the cord, and of its ganglionic cells as well, the cells of the anterior horns in the cervical region seeming to have suffered most.

CASE I.—Mrs. B. W. T. entered the Iowa Methodist Hospital, March 9, 1914, with an admission diagnosis of pernicious vomiting of pregnancy, and the following history was obtained from her attending physician, the husband, and the patient herself:

Female, age 29, married five years; one living child aged two;

no previous miscarriages; vomited rather persistently for three months during the first pregnancy.

Family history negative, with the exception that one sister has twice been confined in a sanitarium for a brief period, on account of some mental disorder.

Previous history: At the age of ten within a period of three months, patient suffered from measles, pneumonia and typhoid fever, but made an uneventful recovery from all; has had a few attacks of tonsilitis; at age of eighteen had a fall which she says produced some uterine prolapse; otherwise, previous history negative.

Present history: Became pregnant about December 15, 1913. About February 1, 1914, began to suffer from severe incessant vomiting, which continued for approximately six weeks, during the first month of which she was cared for in her home by her family physician. On admission to the hospital, March 9, the attending physician on whose service she was admitted made the following clinical notes: "Has been vomiting on an average of ten times a day, more in the morning, but also has severe attacks late in the evening; some blood has recently been observed in the vomitus; yesterday had some abdominal pain and a slight bloody vaginal discharge; thinks she has lost twenty pounds in weight since the beginning of illness; patient brought to hospital on cot; very weak; pulse 116; temp. 99; resp. 24; tongue moist and clean; cranial nerves negative, thyroid gland normal; heart and lungs negative; abdomen retracted; uterus enlarged and palpable; extremities normal. March 13, after restriction of food, and enemata containing large doses of Bromide, the vomiting has been much relieved; uterine pains have increased and the hemorrhagic vaginal discharge has become more profuse; therapeutic abortion deemed necessary. March 13, uterus emptied; patient in critical state for several hours following operation; required considerable stimulation; now much improved; no vomiting." After the last notation patient gradually improved, grew somewhat stronger, and up to April 1 it was thought that convalescence had been thoroughly established. A clinical notation, dated April 1, indicates an unexplainable attack of vomiting, necessitating restriction of food. A pelvic examination at this time revealed no abnormality, and it was thought that patient was developing a neurosis. At this stage of the illness urine analyses were negative, but a blood count revealed a mild degree of secondary anaemia. Shortly after this Mrs. T. noticed that her lower extremities felt very heavy, that they tingled and were painful. This rapidly increased until the numbness was very pronounced. The power of voluntary movement was lost in the lower extremities and the pain became very severe. Within a few hours the same sequence of symptoms developed in the upper extremities, and it was only a short time until voluntary movement was impossible in all four extremities. About this time there occurred a very marked diminution in visual acuity. When the multiple neuritic symptoms became well established, it was noted that some mental confusion developed, the most remarkable feature of which was a loss of memory for recent events. There was no

distinct tendency to fabrication, but the memory defect was identical with that observed in cases of alcoholic neuritis or carbon monoxid poisoning. At one time patient thought that the noises in the hospital were the result of a reception being held.

At the time when I was permitted to see the patient the multiple neuritis syndrome had been established for about two weeks. I found her very dull and apathetic. She responded to questions fairly well, but could not remember events which had transpired ten or fifteen minutes before. There was a marked flaccid paralysis of all four extremities; the deep reflexes were abolished; the nerve trunks were very sensitive to pressure, and the peripheral portions of the extremities were anesthetic and analgesic. The muscles of the extremities and some of the trunk muscles were atrophic. The pupils responded normally to light and distance. At this time a loss of sphincter control tended to confuse the diagnosis, but it was subsequently determined that the incontinence of bladder and bowel was due to her cloudy mental state, and not to spinal cord involvement. A blood Wassermann made at this time was entirely negative. After suffering for over a month from the neuritic symptoms, during which time the stomach and eye symptoms completely cleared up, Mrs. T. was discharged from the hospital, and returned to her home. The subsequent history pertaining to her convalescence I have recently obtained from the patient herself. She makes the following statement: "My hands and upper extremities improved first; the sensibility came back first, then the muscular action began to improve, but it was late in August, 1914, before I could hold my hands on a level with my forearms (on account of wrist drop); I was unable to get about on my feet until February, 1915; the return of sensibility here, as in the upper extremities, preceded that of motion; one thing which delayed walking was the fact that my legs and thighs had become drawn up during the period of their disability, and it took considerable massaging and manipulation to get my knees straightened out; my memory had pretty much returned by the time I began to walk, but even now (December 5, 1920) it is a little bad for recent events." At the time Mrs. T. gave me the history of her convalescence, I made a brief neurological examination for the purpose of ruling out any cord disease, such as tabes, and the only abnormalities I could detect were a slight weakness in the anterior tibial group of muscles, absence of the achilles jerks, and a little tendency to steppage gait. The pupils were prompt to light and distance, and there were no indications of any nervous trouble that could not well be explained by her previous attack of multiple toxic neuritis.

CASE II.—Mrs. H. P., female, age twenty-six; married five years; no living children; husband living and well.

Family history negative, except that the mother of the patient is somewhat neurotic, and vomited a great deal throughout her pregnancies.

Previous history, **negative.**

Some time in July, 1916, patient became pregnant; at about the end of the sixth week began to be very nauseated and vomited frequently; vomiting rapidly increased in severity and reached its acme about the middle of October; every effort to control the trouble seemed to be fruitless; on November 1 it was decided that a therapeutic abortion was advisable, and this procedure was resorted to at once; patient states that she has no recollection of entering the hospital three days prior to the abortion; within a very short time after the uterus was emptied, probably a matter of two or three days, a marked weakness developed in the lower extremities; little pain was complained of, aside from what the patient designated as cramps in her legs; at the time when the lower extremities became disabled there were a few occasions on which the bladder and bowel were evacuated involuntarily.

On November 19 I was permitted to see Mrs. P. in consultation with her family physician, and the following observations were made and noted: Patient is in fair state of nutrition; pulse 110; temp. 99 2/5; resp. 24; heart and lungs negative; pupils prompt to light and in accommodation; abdomen and pelvis negative; ocular fundi negative; hearing normal; speech normal; complains of some dimness of vision; facial movements normal; as is facial sensibility; tongue protrudes straight; palate normal; olfactory and gustatory functions normal. There is a marked flaccid paralysis of both lower extremities, with bilateral absence of both patellar and achilles reflexes. There is a slight bilateral and symmetrical diminution of sensibility to pin prick and cotton wool, most marked in the feet and gradually shading off into normal as the knees are approached. The posterior tibial and sciatic nerve trunks are hypersensitive to pressure. Plantar reflexes normal; the lower extremities exhibit hyperhidrosis; there is some weakness and clumsiness of the upper extremities with a slight suggestion of paresthesia.

The patient's mental state is of great interest. She is somewhat confused at times, highly emotional, and her memory for immediate happenings is extremely poor. She does not remember from one moment to another what has happened. She is disoriented as to time, but not as to person or place. There is no distinct tendency to fabrication, although her confusion as to the lapse of time occasionally causes her to make misstatements. A urine analysis reveals a faint trace of albumen with a few hyalin casts, but is otherwise negative. After having examined Mrs. T. a short time previously, it was not at all difficult to arrive at a diagnosis in this case. I was particularly interested to note the same memory defect occurring in both cases.

In January, 1917, I made a trip to the home of Mrs. P. and made a second examination, with a view to determining the progress or degree of improvement which she had made, and I here present the following memorandum: Mrs. P. presents no abnormalities of the cranial nerves; she has full control of the upper extremities, and there are no sensory changes to be made out, save for a little hyperesthesia of the cutaneous surfaces of both feet. She is now

able to flex both thighs on the abdomen, can move both feet and all the toes quite freely, but cannot extend the legs on the thighs. Dorsal flexion of the feet is still accomplished with great difficulty. The muscles of the lower extremities are uniformly and markedly atrophic, and there is even some atrophy of the lumbar muscles. The nerve trunks in the thighs and legs are still very sensitive to pressure. The sphincters have been under complete control since the time of my first examination. The memory defect has almost disappeared, though there is still some difficulty in remembering recent happenings.

In a recent letter from Mrs. P., in answer to one of inquiry sent her before starting to complete this report, she states that she was unable to be about and use her lower extremities until June, 1917, seven months after the onset of her illness, and she states that her memory was very noticeably impaired for a year after the initiation of her illness, and is, she thinks, still somewhat defective.

In this case, as in the previous one, a diagnosis of multiple neuritis with memory defect, following toxæmia of pregnancy, was, I think, wholly justified, and in this case, as in the former, there was at no time any convincing evidence of puerperal or gestational infection.

CASE III.—Mrs. E. K. E., formerly a nurse, became pregnant some time in August or September, 1918. During the second month of gestation she developed hyperemesis, which reached its greatest severity during the third month, at which time her attending physician considered the advisability of terminating the pregnancy. Being exceedingly desirous of giving birth to a living child, she herself determined to brave the dangers and attempt to continue to full term. During the fourth month of the pregnancy the vomiting became less severe, but about this time she suffered from an attack of the Flu, which contributed greatly to her exhaustion. Very shortly after her recovery from the Flu, in association with a residuum of the vomiting, she developed, rather abruptly, a symmetrical, flaccid paralysis in all four extremities, accompanied by extreme pain, and acute sensitiveness of the nerve trunks. While these symptoms were manifest in the upper extremities, they were much more aggravated in the lower, and the peripheral portions were more involved than the proximal. There was some blurring of vision, slight diplopia, mild delirium, loss of immediate memory, but no tendency to fabrication.

I was permitted to examine this patient at the beginning of the seventh month of gestation. The essential features of the examination were as follows: Temperature 99 4/5; pulse 120; blood pressure, systolic 110, diastolic 80; heart negative, with the exception of a very faint first sound at the apex; abdomen enlarged, the uterus easily palpable, with its fundus extending to a point two inches above the umbilicus; there was no evidence of involvement of the cranial nerves, save for unequal, slightly irregular, fixed pupils, which were unresponsive both to light and in accommodation; there was a

marked weakness of the musculature of the upper extremities, which was perhaps more marked in the extensors of the wrists; sensibility to cotton wool and pin prick was diminished in the hands; the deep reflexes in both upper extremities were present, but diminished; there was slight atrophy of the small muscles of the hands; in the lower extremities a like condition was revealed, only in a more marked degree, the anesthesia and analgesia being very pronounced in the feet; there was great muscular weakness with foot drop; the posterior, tibial nerves were exceedingly hyperesthetic to pressure and a moderate degree of muscular atrophy was noticeable; the patellar and achilles jerks were absent and complaint was made of subjective, deep-seated, aching leg pain; the patient's most characteristic mental abnormality was a diminished immediate memory; in this case this feature was not so pronounced, but was sufficiently so to be readily observed on examination, and to attract the attention of her relatives and bedside companions; a blood count was not made; the urine was at no time of diagnostic interest, though on one or two occasions it contained a slight trace of albumen, with a few casts; the blood Wassermann was entirely negative.

Aside from confirming the diagnosis of the family physician, the principal reason for my having been called in consultation was to determine the advisability of terminating the pregnancy, or allowing the patient to go to full term. In as much as I did not see her until the seventh month of pregnancy, at which time the vomiting had ceased and all the symptoms of the neuritis were receding, and in as much as we felt that delivery at full term would not be attended with much more strain than at seven months, we felt that the chances were about equal, whichever course was taken. We therefore allowed the patient to cast the deciding vote and permitted her to proceed without premature delivery. On March 28, 1919, some time during the eighth month of gestation, she was delivered of a slightly premature child, and died twenty-four hours later. I have been unable to gain any satisfactory information as to the exact cause of death, and am obliged to assume that it was the result of either heart failure or exhaustion.

The points of greatest interest in this case are:

1. The multiple neuritis with memory defect;
2. The fact that she had apparently weathered the storm of gestational toxæmia and an attack of influenza as well;
3. That premature delivery did not take place until the eighth month of the gestational period.

CASE IV.—Mrs. E. W., age thirty-six, married fifteen years. Three previous pregnancies which went to full term; considerable vomiting in the early months of each.

Family history, negative.

Previous history: The patient had one attack, of a psychoneurotic character, at the age of thirty, which lasted three and one half months. Otherwise, previous history negative.

• The pregnancy which seems to have been the exciting factor of

the present illness is thought to have begun June 6, 1920. About June 28th patient began to suffer from hyperemesis, which increased in severity, reaching its acme about July 15th. She was unable to retain anything except a very small amount of nourishment up to the time of therapeutic abortion, which was resorted to August 21, 1920. There was a slight elevation of temperature for a few days subsequent to the curettage, the highest point reached being 102° F. There were, however, no other indications of sepsis. On or about September 1, 1920, patient became disoriented—thought she was in some place other than her home; complained of pain in her lower extremities, especially in the posterior tibial region; within an hour after eating would forget the articles which composed the meal; was also disoriented as to time—could not remember persons who had been in to see her a half hour after they had made their visits, but her memory for past events seemed to be perfectly normal.

At the time of my examination, which was incident to a consultation with the attending physician, on October 19, 1920, I had occasion to verify the mental peculiarities just given. In addition, I found the cranial nerves to be normal; heart and lungs negative; pulse 110; temperature 99 4/5; the movements and sensibility of the upper extremities normal; marked weakness of the muscles in the lower extremities, especially from the knees down; subjective and objective anesthesia most pronounced in the feet, shading off into normal in the vicinity of the knees; extreme tenderness of the calf muscles and pronounced hyperesthesia of the posterior tibial nerves on pressure. Owing to a lack of facilities, a blood count was not made. The urine analysis made by the attending physician just prior to my examination revealed no abnormalities, save a slight trace of albumen.

Basing my opinion upon the clinical history and its sequence of events, together with the unquestionable evidence of neuritis in the lower extremities, and the characteristic mental disturbance, the diagnosis of puerperal multiple neuritis, accompanied by a Korsakoff's psychosis, was made. In a communication received from her family physician, dated January 12, 1921, he states that all mental symptoms seemed to have passed away by November 20, 1920, and the patient was able to walk with assistance December 1, 1920. Her memory at the present time seems to be perfectly normal, but there still remains in the lower extremities some atrophy and reduction of muscular power.

For the sake of clarity, it may be well to emphasize the outstanding features in the foregoing case reports. In all four cases there existed in the early months of pregnancy hyperemesis. In Cases I and IV therapeutic abortion was performed at the end of the third month, and in Case II during the fourth month. In Case III the patient went to the eighth month and was delivered spontaneously. In Cases I, II, and IV, although there was abundance of evidence

of profound toxæmia before abortion, the symptoms of neuritis did not occur until a short time after the uterus was emptied. In Case III the patient struggled through the state of hyperemesis, and just prior to spontaneous delivery during the eighth month seemed to be recovering from her neuritis. In all four cases the clinical evidences of multiple neuritis were sufficiently classical to place the diagnosis beyond reasonable doubt. Cases I and II, because of temporary sphincter incontinence, suggested the possibility of spinal cord involvement, and in Case II the irregular distribution of the muscular atrophies much more strongly suggested cord disease. In all the cases a loss of recent memory and unreliability of statement were very pronounced symptoms. In Case II retroactive amnesia was a prominent feature. In Case III death occurred after delivery, while in Case IV sufficient time has not yet elapsed to make a report possible. She is, however, convalescent. In Cases I and II, both patients feel that they have never fully regained their original powers of immediate memory, seven and five years, respectively, after the onset of their illnesses. Mrs. T. (Case I) still has absence of the patellar reflexes and a slight tendency to foot drop.

...In conclusion, I wish to emphasize the following salient clinical facts:

1. That toxic multiple neuritis is a frequent sequel to hyperemesis gravidarum.
2. That multiple neuritis may develop during gestation or in the puerperium without any dependable evidence of underlying infection.
3. That a mild psychosis of the Korsakoff type is very prone to occur in this type of multiple neuritis.
4. That therapeutic abortion is perhaps too long deferred in many cases of hyperemesis and is the best remedial measure, and the most sure means of preventing multiple neuritis.
5. That the Korsakoff psychosis was recognized as a very common accompaniment of multiple neuritis following hyperemesis gravidarum, long before Korsakoff affixed his name to the same syndrome which he observed in alcoholic neuritis.

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TWO CASES OF EPIDEMIC ENCEPHALITIS, SHOWING UNUSUAL NEUROLOGIC FINDINGS¹

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The report of several cases by Kennedy (1) showing a most unusual combination of neurological symptoms, under the caption of "Acute Benign Meningo-Encephalitis With Papilledema," has prompted us to report two cases that have been on the Neurological Service of Dr. Leszynsky at Lebanon Hospital. These cases in the main manifested clinical pictures strikingly akin to those reported by the above writer. They also showed an acute febrile onset, sore throat, sneezing headache, etc., followed by hemiplegia, cranial nerve involvement with hemianopsia, together with mental confusion, disorientation, etc. Both cases also showed an optic neuritis with slow recession. The additional striking feature was, that both cases showed a thalamic involvement.

Both cases were on the ward the same time, one case arriving within several days of the other, which lead us to assume that these unusual cases were in all probability atypical types of epidemic encephalitis, and are presented as such.

Case I. C. H., male, forty-two years old, tailor, admitted to Lebanon Hospital, November 13, 1921. One week previously complained of sore throat, coryza, sneezing headache and slight fever. He retired after supper, awoke one hour later and found he could not walk to the bath room. His left upper and lower extremity was paralyzed. There is a history of blurred vision, but no diplopia.

His temperature on admission was 100° F. and at no time was any higher. Nothing referable to his gastrointestinal, heart or genitourinary tract was found. He showed a left hemiplegia, with slight rigidity, and slight voluntary movement. There was rigidity of the neck.

Eyes: Pupils unequal L > R, both reacted to light and convergence. Consensual response was present but sluggish. Corneal response was feeble on the left. A slight ptosis of the left lid was

¹ From the Neurological Service of Dr. Wm. M. Leszynsky, at Lebanon Hospital.

observed, together with a distinct weakness of the left abducens. Paresis of right facial muscles was present.

Upper Extremity: Gross motor power diminished bilaterally, the deep reflexes being a shade increased on the left. There was a diminution of the left abdominals. Lower Extremity: The left lower extremity could not move voluntarily. The left knee jerk response was weaker than the right, although the former gave an ankle clonus and a Babinski. The left cremaster was absent. A bilateral Kernig was present.

Sensory Exam.: There was complete hypaesthesia and hypalgesia, together with thermal involvement of the left half of the body including the left face. Muscle and joint sense was involved. Vibration was perceived on the left side at the anterior superior spine and above, but not at the ankle and knee.

Crying and laughter was easily produced. Memory defects were present. April 17: In the main his symptoms were the same, except his rigidity of the neck was somewhat diminished; voluntary movement of his left leg was perceived, with returning sensation on the left side of face.

Fundus Exam.: Showed a double optic neuritis of two diopters and also an old retinal exudate which had no bearing on his present condition. Repeated urine examination with prolonged centrifugation failed to show any trace of albumin or casts. Blood chemistry showed no retention. Blood Wassermann was negative. Spinal tap showed the fluid under pressure, clear and contained 15 cells, containing 64% polys. Fehlings was reduced, Wassermann negative and Naguchi negative. April 21: Status unchanged. Throat and nose cultures—Gram, *negative*; Short bacillus, influenza. April 23: Weakness of left abducens was disappearing. The right palate and uvula showed paralyse, with nasal speech. Increasing power in the left leg was present—raising this extremity two feet above the head. The arm also showed some improvement. Rigidity of neck and Kernig signs were diminishing. A perimetric examination revealed a left hemianopsia. Swelling of the disk was less, although there was still present a blurred outline of the margins. Dec. 7: Pareses of the right face and left abducens had entirely disappeared. Superficial sensibility was entirely recovered in the left lower extremity, up to Poupart's ligament, with a marked improvement in muscle power. Deep sense was now involved in both upper and lower extremity. His optic neuritis had vanished. When last seen he showed a mild hemiplegia with a partial thalamic involvement. His hemianopsia has partially cleared up.

Case II. Male, age forty-six, embroiderer, married, admitted to Lebanon Hospital November 20, 1921. In this case there is also a history of a previous mild febrile infection, followed by a loss of power of the left half of the body.

Examination showed him to be slightly stuporous but conscious,

answering questions with slow, labored speech. There was some rigidity of the neck, with pain on pressure over the suboccipital region, more marked on the right. Eyes: Pupils were equal, reacting to light and accommodation. Corneal response was absent on the left, and a slight reduction of outward movement of the right eye. A left hemiplegia was present with slight rigidity. The knee jerk was 1 plus, the cremaster was absent; no ankle clonus, and the plantar response was normal. The right foot, however, showed an inconstant Babinski.

November 23: Patient showed a double Von Graefe, a weakness of the left upper lid. An inability to converge the eyeballs, and a paresis of the left abducens was noted. All the abdominals as well as both cremasters were absent.

The left knee jerk and ankle jerk was 1 plus, an exhaustible clonus, and an inconstant Babinski was found. Whereas the right lower extremity showed a definite Chaddock and Oppenheim, but no Babinski. Rigidity of the neck and a bilateral Kernig was present. Sensory Exam.: A loss of all cutaneous sensibility was observed on the left, from the thigh downward. Deep sense, *i.e.*, postural and vibratory, were partially preserved. Mental Exam.: Patient was drowsy and repeatedly fell asleep during the examination. He showed a partial disorientation. Memory tests, both ordinary and special, showed no involvement.

November 26: Motility of both paralyzed extremities improving. Well marked ankle clonus on left. The right cremaster was returning, and rigidity of the neck was less marked. Fundus Exam.: O. D. the disc showed a swelling of one diopter, with venous engorgement. O. S. there was an elevation of one and a half diopters. Diagnosis choked discs. Repeated urine examinations, blood chemistry, and blood Wassermann was negative. Spinal tap was bloody and a cell count could not be obtained. It came out under pressure, and showed a negative Wassermann.

December 7: Patient showed a marked improvement in all his symptoms. Corneal response was improved. Return of ocular convergence was noticed, and facial paresis was disappearing. Movement of the left shoulder joint was limited, and there was still weakness of the extensors of the arm and forearm. There was noticeable a thinning of the interossei, thenar and hypothear eminences, together with the opponens pollicis. The left lower extremity showed greatly increased power. The deep and superficial reflexes were unchanged.

Sensory Phenomena: Superficial sensibility showed improvement, but deep sensory involvement was stationary. The double choked disc had practically disappeared.

When last seen his residuals were a mild left hemiplegia, together with some involvement of his deep muscle and joint sensibility. Regarding the disappearance of the choked discs, this has been observed by a number of writers in the last epidemic. Stephenson (2) in his notation concerning the cerebral types of this disease,

mentions two cases that had papilledema that later disappeared; and Alexander (3) also observed two cases, one of which died, showing histologically an optic neuritis, while the other patient recovered, taking six months for the papilledema to disappear.

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CURRENT LITERATURE

II. SENSORI-MOTOR NEUROLOGY.

4. MEDULLA—MIDBRAIN (ENCEPHALITIS).

Müller-Bergalonne, G. FIRST AUTOPSIED CASE IN SWITZERLAND OF ACUTE POLIOENCEPHALITIS (so-called Epidemic Encephalitis Lethargicâ). [Correspbl. f. Schw. Aerzte, Nov. 6, 1919, Vol. XLIX, p. 45.]

Clinically the patient, a woman of twenty-eight, presented signs of tuberculous meningitis. Her previous history showed periods of wasting, accompanied by coughs which pointed to a tuberculous tendency. In November, 1918, there was a period of fatigue and psychic depression, great loss of weight in December with intense cephalalgia localized in the right temporal region, as well as subjective ocular difficulties. The examination of the eyes and ears was negative. A slight progressive fever set in about the first of February, then photophobia, nausea, vomiting, a marked discordance between the temperature (39.8° C.) and the pulse (80), irregularity in the beating of the heart, a slight somnolence without any definite characteristics, the diagnostic importance of which was not recognized until later. Positive meningitic streak, retracted abdomen, stiffness of the neck, monocular diplopia to the right, distinct Kernig's sign. Examination of the cephalorachidian liquid resulted in: Nageotte 42 lymphocytes per cu. mm., no polynuclears, numerous red globules, and no microorganisms—all indications which point to tuberculous meningitis. Suddenly, on the sixth day of the febrile period, the patient fell into a coma and died quickly with bulbar phenomena of respiratory ataxia. The autopsy and microscopic examination made by Prof. Askanazy excluded the tuberculous nature of the affection. There were no old nor recent traces of tuberculosis. In the abdominal and thoracic organs only were phenomena of accentuated hyperemia to be found. In the cranium the hemispheres were found to be flattened, there was hyperemia of the meninges, hyperemia and edema of the brain. The ventricles were not dilated, the intraventricular liquid diminished rather than increased. The nature of this cerebral affection could only be revealed by the microscope. There was found to be intense hyperemia, some ecchymoses and especially a pronounced infiltration of the vascular walls from the cerebral peduncles to the part where the bulb had been cut in the autopsy. In addition, inflammatory infiltrations were noted in the cerebral nervous substance itself, which was strongly edematized with ganglionic cells often greatly impaired, tumefaction, proliferation and ameboid phenomena of the neuroglia cells; but the most striking modifi-

cation was the existence of occasional voluminous fringes of lymphoid cells in the adventitious portions of the vessels, especially the small veins, the lumen of which was greatly dilated. Among the cells infiltrating the vascular wall were to be distinguished the small lymphoid cells and, less numerous, the larger cells containing basophil protoplasm and sometimes amyotose nuclei. The modifications were observed on each slide, but the main seat was found in the region of the substantia nigra, at the point of the aqueduct and in some portions of the spinal cord (from VI to beyond VII). It is striking to see that the localizations appear on the level of the gray matter and in the proximity of the ventricles. Anatomically and histologically there is left only the differential diagnosis between so-called encephalitis lethargica and Heine-Medin's disease. The clinical and epidemiologic phenomena as well as the anatomic localization argue in favor of the polioencephalitis or lethargic encephalitis. No microorganisms were found either by Giemsa's method or by that of pyronin-veite, methylene method, or by that of Levaditi. [Author's abstract.]

Bosman, J. F. M. ENCEPHALITIS LETHARGICA WITH SENSORY CHANGES. [Nederl. Tijdschr. v. Geneeskunde, 1919, July 19, p. 186.]

Bosman records a case of encephalitis lethargica in a woman of thirty-two, in whom sensory impairment, especially in the trigeminal nerve area, was an early and prominent symptom. It lasted from the onset till her recovery nineteen days later. Three days before Bosman saw her she had sudden giddiness, vomited frequently, and felt a cold, stiff feeling beginning just above the left angle of mouth, and then extending over the whole left face and temple up to the vertex; on the left side of her mouth her food had a ferruginous taste; no headache. She had a heavy, sleepy expression, and there was great impairment of sensibility to pin-prick in the cutaneous area of the left trigeminal; there was also defective movement of the mandible to the left. Left corneal reflex abolished. Rombergism. Not much fever. Four days later she complained of a cold feeling in right foot and leg, with objective hyperesthesia there. Right plantar diminished, but no Babinski. Slight weakness of right leg. She says she had diplopia for a few hours the day before; now feels a full feeling in throat as if food won't go down. Vomiting still frequent; two days later a cold feeling in right arm; taste better; still very sleepy. Four days later better, but still has a tight feeling in the left V¹-area; left corneal reflex returned; taste normal. Six days later recovery from all symptoms. [Leonard J. Kidd, London, England.]

Lacroix. INCOMPLETE LETHARGIC ENCEPHALITIS WITH TRANSIENT DIPLOPIAS. [Journ. de Méd. de Bordeaux, 1920, XCI, p. 128.]

Lacroix reports to the Bordeaux Society of Medicine and Surgery a series of observations on seven patients who all presented an almost identical clinical picture: slight fever, asthenia, somnolence, transitory

diplopia, ptosis, internal ophthalmoplegia, and sometimes facial palsy. The fever is always slight. Somnolence is specially marked when the patient settles down quietly; he answers questions slowly, but has a clear consciousness of his actions. In spite of his lethargy, his nocturnal sleep is sometimes restless. The diplopia lasts from two to six days. The ptosis either accompanies or follows the diplopia, and disappears in about eight days. The internal ophthalmoplegia, usually bilateral, is transient; there is commonly inequality of pupils. These palsies, which are not specific—the Wassermann being negative—closely resemble the postinfectious paralyzes, and especially the postinfluenzal. They must be regarded as cases of an incomplete and attenuated form of lethargic encephalitis. [Leonard J. Kidd, London, England.]

Claude, Henri, and Lhermitte, Jean. SUBACUTE LEUCOENCEPHALITIS WITH SUCCESSIVE LESIONS. [*L'Encéphale*, Feb., Vol. XV, p. 89.]

The authors use the name subacute leucoencephalitis to designate a disease picture observed by them. A patient 20 years of age presented symptoms which may be summed up as follows: The onset of the disease was insidious and progressive, resulting soon in definite motor and psychic disturbances to the extent that both lower and upper extremities were paralyzed and patient was confined to her bed. A period of remission followed and then a second access with fever and symptoms indicating new foci—aphasias, apraxias, etc. After a second remission other phenomena supervened, pointing to bilateral irritation of the lenticular nucleus and internal capsule, together with contractions symptomatic of irritation of the pyramidal tracts. The course of the disease was progressive,—in stages, with remissions—but without any permanent intellectual defects and without continuous delirious conditions. The most striking feature revealed by the autopsy was the topographical distribution of the cerebral alterations. The centrum ovale, corpus striatum and optic thalamus were affected but the cerebellum, medulla, spinal cord, pons and midbrain showed no changes, with the exception of secondary degeneration in the pyramidal region. There was every evidence that the lesions had reached their maximum in the centrum ovale and that they had radiated from this area, on the one hand toward the pallium and on the other toward the ganglia of the base, extending also to the corpus callosum and the interhemispheric white commissure. Both inflammatory and necrotic elements were recognizable in the lesions. Alterations of the vascular system with thrombotic tendencies indicate the origin of the disseminated necrotic foci, which were so minute that they were only discovered by the histological examination. While these foci were related by both their thrombotic origin and their histological character to those which are often found scattered through the brains of aged subjects, they were distinguished from these latter by the intensity and the quality of the reactions of the neuroglia, consisting not only in proliferations in the form of ameboid cellules and phagocytes, but also of large num-

bers of astrocytes and giant cells with prolongations. Destruction of parenchyma was recognizable in the necrotic spots. In the opinion of the authors the disease may be considered as a toxi-infectious process giving rise to the inflammatory and necrotic reactions. They believe they are justified in regarding the picture as a separate nosological entity, of which the diagnosis may be definitely made from the clinical symptoms. They mention a similar case described by Claude and Lejonne. The etiology was not determined as it was not possible to make a bacteriological examination, but in their opinion the exciting agent was probably analogous to that which is responsible for syphilitic affections with selective affinity for centro-hemispherical regions. [J.]

Bonnard, A. LYMPHOCYTOSIS OF THE CEREBROSPINAL FLUID IN EPIDEMIC ENCEPHALITIS. [Gaz. Hebd. Sci. Méd. de Bordeaux, 1920, XCI, May 16, p. 233.]

A study of the cytology of the cerebrospinal fluid is said to help us to diagnose between tuberculous meningitis and epidemic encephalitis: the meningeal bacillosis of the former excites a reaction which increases with the duration of the illness, whereas the lymphocytosis of the latter, though sometimes massive at the onset, rather quickly lessens and disappears. Mestrezat found that in tuberculous meningitis there is a marked, and almost constant, decrease in the amount of chlorides in the spinal fluid, which varies between five and six grammes (7.32 being the normal). In two cases the writer found 7.15 and 6.90, respectively. In one case Mestrezat found a normal ratio of chlorides. Bonnard concludes that (1) in epidemic encephalitis the cerebrospinal fluid shows a more or less marked lymphocytosis 89 per cent of cases, either with or without associated hyperalbuminosis; (2) hyperalbuminosis, with or without lymphocytosis, occurs too seldom (43 per cent) to be worth consideration; (3) the lymphocytosis associated with a normal or nearly normal ratio of chlorides may be an element of differential diagnosis between epidemic encephalitis and tuberculous meningitis, the latter disease showing a diminution. [Leonard J. Kidd, London, England.]

Turretini and Piotrowski. LUMBAR PUNCTURE IN EPIDEMIC ENCEPHALITIS. [Rev. Méd. de la Suisse Romande, 1920, May, p. 283.]

In twenty-five cases of epidemic encephalitis the cerebrospinal fluid was examined to determine the clinical value of such studies. Seven were oculoletargic cases, seven myoclonic, three a mixture of these two groups, and eight were of nervous type (delirium, agitation, choreiform movements, intense pains, etc.). In all the fluid was clear; all cultural attempts failed. Pressure was never increased, and the ratio of chlorides was normal; the albumen has varied from 0.10 per cent to 0.25 per cent, tending to a slight increase as the disease evolves, no matter what its clinical type may be. Lumbar puncture gave positive results in 22 out of the 25 cases. The writers conclude that the formula

of epidemic encephalitis appears to be normal, or very slightly increased. albumen, with normal pressure and ratio of chlorides. Rarely lymphocytosis, especially in the oculoethargic cases; slight, or absent, at the onset of the myoclonic and nervous forms; this lymphocytosis rapidly lessens with regression of the symptoms. An early increase of sugar in the fluid (hyperglycorrhaphy) can be a help in diagnosis when lymphocytosis is absent. Lumbar puncture is of no therapeutic value in the disease, but is necessary for diagnosis of the incomplete and atypical cases. Thus, epidemic encephalitis has a cytological formula sufficiently characteristic to prevent any confusion with other encephalitic or meningeal conditions. [Leonard J. Kidd, London, England.]

Jacobsen, Harold. LETHARGIC ENCEPHALITIS. [Ugeskrift für læger, 1920, No. 7.]

In a series of observed cases of lethargic encephalitis the following is perhaps of greatest interest: A young man, twenty-five years of age, of good health, gets a common indisposition, weariness, faintness, headache (one single day), giddiness, low laborious speaking, neuralgias principally along the spinal column with paroxysmal acute pains of the loins and from cardia radiating down towards the middle line, coincident with laborious respiration and clonic spasms of the arms. Further, staring eyes, the face taking the shape of a mask, obstipation, rigidity of extremity muscles and tightly strained abdominal muscles, slow and temporarily suspended patellar and plantar-reflexes. Moreover, the patient is for eight to fourteen days very restless, suffering from ataxic movements, fits of deliriousness, insomnia, apathy, in the course of a few days increasing to a deep stupor with contracted, immovable pupils, right sided facial pareses, convulsions of the fibers of face- and extremity-muscles, clonic spasms, incontinentia urina, strabismus divergens, rigidity of the neck, positive Kernig's symptom, nystagmus. After a few days the patient got better and the symptoms successively disappeared; still for some days strong neuralgias, diminishing gradually, leaving the patient in a state of predominating lethargy. Temperature almost constantly 36.5 C.; pulse soft, about 80. No increased pressure of the spinal liquid. Ophthalmoscopi negative. After a long convalescence the patient recovered. As will be seen nearly all symptoms described were found. The most peculiar feature and to a certain degree, characterizing the case, were the neuralgies along the spinal column at the beginning, also in the abdomen. Being very strong they were especially annoying symptoms to the patient. They were there almost as long as the acute phase lasted, now and then very severe. Soreness of spinal column, direct and indirect as well, was observed. Pains at bending the head at Kernig's experiment. Undoubtedly it was partly owing to these pains that the lethargy was not always equally conspicuous, the patient having several times remarked that he would at any time be able to sleep or doze if it was not for the pains; this statement proved to be right when

the pains eventually ceased. Increase of temperature was not observed. Rigidity of muscles was conspicuous, including those of the face, the tongue, the mouth, the body, particularly those of the abdomen. There were successive affections of a number of brain nerves. Whether the occasional respiration trouble was due to affection of vagus or rigidity of respiration muscles is uncertain. Connection with influenza could not be shown. The neuralgias, the soreness of the remaining spinal symptoms suggest a spinal localization—whether related with poliomyelitis or not must remain doubtful. [Author's abstract.]

Anglade and Verger. ENCEPHALOMYELITIS WITH PSEUDO-PARKINSONIAN ONSET. [Journ. de Méd. de Bordeaux, 1920, XCI, p. 93.]

Anglade and Verger report to the Bordeaux Society of Medicine and Surgery the case of a woman of forty-one, who came complaining of misty vision. Ophthalmoscopy negative. Her aspect was exactly that of paralysis agitans without tremor; gait slow, tendency to fall. Tendon and peristea reflexes exaggerated; no Babinski's sign. Mental torpor. Normal cerebrospinal fluid, urine, and temperature. Fifteen days after admission she had a tendency to narcolepsy, and then appeared incomplete paraplegia with plus reflexes and Babinski's sign, a sacral eschar, contracture of jaws, inertia of upper limbs, and finally complete paraplegia with intellectual torpor. She died three and one half months after the onset. Necropsy showed very marked subarachnoid edema, and congestion of the pia mater, without adhesions. No visible lesions of cerebral cortex or of central nuclei. The spinal meninges in the cervical region were edematous, and the whole of the spinal cord was softened. [Leonard J. Kidd, London, England.]

Dubourg. ENCEPHALOMYELITIS WITH PARKINSONIAN ASPECT. [Journ. de Méd. de Bordeaux, 1920, XCI, p. 127.]

Dubourg reports to the Bordeaux Society of Medicine and Surgery the case of a boy of thirteen who had for eighteen days had headache and hebetude, with contracture of the facial muscles, and trismus. The head was bent forward, the upper limbs semiflexed, forearms supinated, first phalanx flexed, and the other phalanges extended. There was forced extension of lower limbs, with equinism. No Kernig sign. Tendon jerks exaggerated, especially left. Sensibility normal. No Babinski sign. Pupils small; no ocular palsies. Vesical and rectal incontinence. Veins of lower limbs greatly dilated. Frequent attacks of intense sweating. No narcolepsy, but much torpor; eyes open, but fixed. Movements very slowly performed. A sacral bedsore. No respiratory symptoms; appetite good. Cerebrospinal fluid clear, not under tension, with only ten lymphocytes to the field, 0 gr. 40 of albumen, no microbes, negative Wassermann. Temperature at first 38.6° C. to 39.6°; then fell in a few days. On the ninth night after admission, patient, who till then had been inert, became very agitated and delirious; he rose and complained of his bedsore.

From this time he became more wakeful; contractures diminished, incontinence disappeared. Improvement continued, and he now plays with his mates. But he still has slight contracture, and also certain fixed ideas. [Leonard J. Kidd, London, England.]

Abadie and Hesner. A PURE PSYCHICAL FORM OF EPIDEMIC ENCEPHALITIS. [Gaz. Hebd. Sci. Méd. de Bordeaux, 1920, XLI, p. 314.]

The writers present a case of an acute, agitated, delirious psychosis on a basis of mental confusion, but more of delirious agitated nature than of truly confusional. In the acute stage its features somewhat resemble those of alcoholic delirium tremens, but the hallucinations have a much greater richness and objectivity. The psychopathic prodromata lasted as long as forty days. Patient, twenty-four, an unmarried coppercutter, had a good family history, and was not alcoholic. Intelligence moderate, but no mental feebleness. Up to December 20, 1919, was in perfect health; then, gradual restlessness without obvious reason, and he lost faith in his fiancée to whom he was greatly attached. A few days later, suddenly left for Paris to find her; there he made strange incoherent charges; returned; then denied his visit, received his lover coldly, and appeared not to know her. Then he entered a state of delirious mental confusion, had attacks like nightmare both by day and night, slept badly, said his people wanted to kill him, etc., and was very anxious. After eight days of this dreamy delirium he quieted down, but was still uneasy and depressed, with outbursts of temper and ideas of persecution; all this without fever. Then, on January 20th, the confusion and dreamy state returned, with grandiose ideas (made president, regimental commander, etc.). Then, visual hallucinations of rats biting his toes. Became worse early in February, and was violent. Admitted with symptoms as of delirium tremens; sluggish pupils, lively reflexes, dry, tremulous tongue, fine tremor in limbs, quick feeble pulse, and high fever. He improved directly when a fixation-abscess was opened. Negative Wassermann, in spinal fluid. He then was rather somnolent, and soon his mind cleared. Afterwards he had diplopia from left abducens palsy. The writers think that, although the epidemic encephalitic nature of this psychosis is not proved, yet it is probably shown by the transient ocular palsy during convalescence. They call this case a new pure psychical form of epidemic encephalitis, "acute epidemic psychoencephalitis." The other varieties are represented by (1) the lucid, catatonic, true confusional (catatonic, bradypsychic, etc.), and (2) Korsakow's psychosis. [Leonard J. Kidd, London, England.]

Cruchet. DIFFUSE ENCEPHALOMYELITIS. [Journ. de Méd. de Bordeaux, 1920, XCI, p. 93.]

Cruchet reports to the Bordeaux Society of Medicine and Surgery the case of a female domestic servant, aged twenty-eight, who, after symptoms of mental distraction and melancholia, became feverish and

delirious. After some days of irregular temperature the fever rose to 40° C. There was dissociation between the temperature and the heart-beats, more or less torpor, exaggerated knee-jerks, right Babinski sign, painful hyperesthesia of lower limbs, and sacral bedsores. Death in coma. There was only slight lymphocytosis of the cerebrospinal fluid. Necropsy revealed marked hyperemia of the meninges, and a layer of milky lymph between the hemispheres. Cruchet holds that the term lethargic encephalitis is inexact and insufficient, because the combinations of the symptoms vary so much; he prefers the term diffuse encephalomyelitis. [Leonard J. Kidd, London, England.]

Camac, J. A CASE OF ENCEPHALITIS: LETHARGY AND MYOCLONUS. [Brit. Med. Journ., 1920, May 22, p. 704.]

An old soldier, who had had typhoid fever and influenza, and is now a steel-dresser in a shipyard, felt ill on April 2, 1920, with headache, diplopia, pain and stiffness of neck and right shoulder; next day right ptosis and double internal squint. About a week later twitching of muscles of neck and right face. On April 16th admitted in drowsy state; temperature 99.4° F., pulse 84, systolic blood pressure 130; viscera normal. He lay indifferent, answered questions if vigorously roused, was intelligent, though slow of cerebration, relapsed readily into lethargy, but did not sleep at night. He had striking myoclonic movements of face and neck, rhythmical, sixty a minute, affecting the levator anguli oris, masseter, temporal, sternomastoid, and upper part of trapezius of the left side. No affection of diaphragm or sphincters. Brisk knee-jerks; absent abdominal and epigastric reflexes. Pupils react to light, but not on accommodation. Ptosis of right, double internal squint, and inability to close left eyelid. Optic discs normal. Clear cerebrospinal fluid, under pressure, with cell count under ten. Negative Wassermann in blood and spinal fluid. A month later condition was unchanged, except that lethargy was slightly less and ocular symptoms had abated. The case, then, conforms to the lethargic syndrome with the dominant exception of the myoclonus. [Leonard J. Kidd, London, England.]

Kruisinga, H. J. RAPID CHANGES OF CUTANEOUS HYPERESTHESIA IN ENCEPHALITIS LETHARGICA. [Nederland. Tijdschr. v. Geneeskunde, 1920, LXXIV, June 19, p. 2286.]

Patient, aged seventeen, came for diplopia due to left abducens palsy; nothing else. Three days later, headache, muzziness, somnolence, only slight fever, bilateral slight ptosis, and left abducens palsy; no eye-ground changes. Great hyperesthesia of abdomen up to navel. No meningeal symptoms; normal jerks and plantars. Rombergism, unsteady gait. In a few days the diplopia vanished; but nystagmus and ptosis were present; cutaneous hyperesthesia of neck and of dorsal aspect of arms, which went next day. In a few days the skin of the abdomen was hyperesthetic, and later that of the neck and extensor aspect of legs.

Somnolence continued. Encephalitis lethargica diagnosed. Twenty-five days after the onset there was only dizziness and paresis of the levator palpebræ. Gradual recovery after six weeks. The features of this case were the slight fever, slow course, and the great and rapid changes in the cutaneous hyperesthesia which dodged about from one place to another. [Leonard J. Kidd, London, England.]

Cramer, A., and Gilbert, R. A CASE OF RAPIDLY FATAL AMBULATORY EPIDEMIC ENCEPHALITIS. [Rev. Méd. de la Suisse Romande, 1920, May, p. 301.]

The writers record a case of ambulatory epidemic encephalitis of the neuralgic form ending fatally by repeated Jacksonian fits. A man, thirty-eight, had great fatigue, headache, and visual disturbances (not diplopia), with excessively violent pains in calves, at the end of January, 1920; but he continued his work. A fortnight later the pains settled in his left knee, suggesting acute articular rheumatism, and then he had pain in loins. The day before his death the pains went to his left arm, which he could hardly move; they came first in the thumb, then the hand, and then the upper arm. On the night of his death his wife noticed slight involuntary movements in his left hand. On February 24, the day of his death, he was greatly fatigued, and had no appetite, but he kept on at work. He was soon found lying unconscious. Then he had fits beginning in the left hand; they spread to the left arm, and then he lost consciousness and the left leg was convulsed; the right side was not affected. Half a dozen such attacks occurred. He was then admitted to hospital. The convulsions began on the left side, the head and eyes being deviated to left; later, the fits affected the right side. Venesection and cardiac tonics did no good. Death half an hour after admission. Necropsy: dura tense. A meningeal hemorrhage behind the Rolandic fissure. Microscopical examination showed typical lymphocytic infiltration round the vessels of the mid-brain. On the right side the Rolandic cortex is very edematous, and shows perivascular lymphocytic tracks. [Leonard J. Kidd, London, England.]

Redlich, Emil. CONCERNING ENCEPHALITIS PONTIS ET CEREBELLI. [Ztschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXVII, p. 1.]

The author describes six cases observed by him which he diagnosed as encephalitis pontis et cerebelli, relying on the similarity to a former case observed by him in association with Wagner-Jauregg and v. Economo where the obduction and microscopical examination revealed an encephalitis localized exclusively in the pons and cerebellum. After a review of the relatively rare cases in the literature where the encephalitic process was found to develop in the mid-brain, hind-brain, and after-brain with a more or less constant clinical picture, he states that these cases as well as his own fall naturally into two groups as far as the course is concerned. The majority, especially those following acute

infectious disease and those accompanied by fever, run an acute course. The phenomena develop within a few days, and in a relatively short time, or after a few weeks or months, end in recovery or improvement. These recoveries are explained by the assumption that the nervous elements are much less responsible for the evolution of the symptoms than hemorrhages, disturbances of circulation, or edemas. A second part of the cases follows a subacute course, the disease developing gradually in days or weeks, and here, after weeks or months, recovery may take place, or death—this latter not infrequently after years. The individuals affected are mostly young men, and the disease usually appears as result of such affections as typhus, variola, whooping-cough, angina, dysentery, sausage or meat poisoning, skull trauma, or emotional disturbances. In regard to the symptoms, there are rarely affections of the sensory sphere, sometimes slight stupor, opticus usually not affected, though there are, nevertheless, frequent disturbances of sight in the form of nystagmus, paralysis of the eye muscles (especially of N VI and III), resulting sometimes even in complete ophthalmoplegia externa. There is also sometimes paralysis of the facialis, affections of the trigeminus, or acusticus, scanning speech, difficulties in swallowing, cerebellar ataxia, adiadokokinesis, spontaneous deviations in indicating, hemianesthesia, sometimes crossed hemiplegia. In making the diagnosis there is often difficulty in differentiating from hemorrhages, softenings, tumors of the pons, and from meningitis (to be determined by lumbar puncture), and multiple sclerosis from which encephalitis pontis may be distinguished by the circumstance that it develops in an acute or subacute manner and proceeds in a relatively short time to death or recovery, or to a more stationary stadium. As a rule remissions, changes of the opticus, spastic phenomena, pyramidal and spinal symptoms, and intention tremor are not observed. [J.]

Froment, J., and Bouchut. MYOCLONIC EPIDEMIC ENCEPHALOMYELITIS. [Lyon Médical, 1920, CXXIX, p. 445.]

A workman, aged forty-six, had persistent hiccough, moderate fever, mental clouding and dreamy delirium, sluggish pupils, but no somnolence, lethargy, nor meningéal signs. There was loss of knee-jerks, and a marked lymphocytosis of spinal fluid. A few days after the onset the hiccough gave way to myoclonic shocks which affected the right lumbo-abdominal region and the right lower limb, the quadriceps and adductors, but predominantly the insertions of the crural biceps, the tibialis anticus, and the bundle of the extensor communis digitorum that goes to the second toe. Two months later patient was in good health, but the myoclonic shocks still persisted, though in somewhat less degree; they now affected only the biceps and tibialis anticus. The knee-jerks had returned, but the right was easily exhaustible; the pupillary reactions were still sluggish. The localization of the myoclonic shocks to the biceps (to the exclusion of the other flexor muscles of the knee) suggests

that the residual lesion in this case was in the spinal cord, in the region of L₄ and L₅. (The writers cite a case of this kind in which a lesion of the gray matter of the spinal cord was demonstrated on microscopical examination.) [Leonard J. Kidd, London, England.]

Mouriquand, G., and Lamy, M. LETHARGIC ENCEPHALITIS IN A GIRL OF TWELVE. [Lyon Médical, 1920, CXXIX, April 10, p. 318.]

The writers record a case of lethargic encephalitis which had three definite stages: (1) of cerebral excitement, with impulsive movements and delirium, but with only slight fever, lasting for three days; (2) of prostration, somnolence, increasing daily, and temperature going as high as 40° C., with ptosis, but no evidence of a meningeal reaction, there being only slight lymphocytosis of the spinal fluid which was not under tension; this stage lasted about ten days; (3) one of remission of symptoms of depression, with desire to play with her toys, only slight fever, but appearance of signs of a slight meningeal reaction in the spinal fluid, and of excitation of the pyramidal system (left Babinski); this stage lasted only twenty-four hours. Treatment consisted in urotropine, by mouth and by intravenous injections. [Leonard J. Kidd, London, England.]

Chalier, J. PROGNOSIS AND TREATMENT OF EPIDEMIC ENCEPHALITIS. [Lyon Médical, 1920, CXXIX, April 25, p. 360.]

In epidemic encephalitis the lethargy, though sometimes predominant, may be little marked or even absent. The prognosis is difficult to make. The writer's experience leads him to look on elevation of the temperature to 40° C. as a grave sign. Tachycardia, even without hyperthermia, is of bad omen; so is polypnea (40 to 50), without much fever. These symptoms point to bulbar involvement. The excited cases are graver than the pure lethargic ones. One mistrusts the diffusion and the progression of some symptoms, such as myoclonic jerks, especially of the diaphragm, and more or less generalized choreiform movements. Slight spinal lymphocytosis has no special prognostic value. The treatment is not well settled. Possibly intravenous injections of urotropine, colloidal medication, and leucogenic medication are useful. Yet one has the impression that death occurs more from intoxication than from infection. The writer has tried the serum of convalescents from epidemic encephalitis in one bad case who was, however, at that time in a fair way to recovery. He suggests trials of this method. [Leonard J. Kidd, London, England.]

Chalier, J., and Longy. CEREBELLAR SEQUELÆ OF EPIDEMIC ENCEPHALITIS. [Lyon Médical, 1920, CXXIX, p. 441.]

The writers record a case of a patient who, twelve days after apparent recovery from an attack of epidemic encephalitis with alternations of excitement and somnolence, showed very marked myoclonic shocks in the whole of the right upper limb, which lasted about a minute, returned in five minutes, and continued in this way for about ten hours. Repeated

examinations during several subsequent days showed the presence of cerebellar signs, confined to that limb, viz.: asynergia, adiadokokinesia, dysmetria, intention tremor, and inability to write, with much diminution of motor power in that limb. All the tendon-jerks were exaggerated, but there was no nystagmus. After seventeen days the cerebellar signs had not completely disappeared. Although the possibility of cerebellar involvement has been recognized in epidemic encephalitis, there does not appear to be any other recorded case of a relapse of a cerebellar type in this disease. [Leonard J. Kidd, London, England.]

Niclot, Cusset, and Roubier, C. ACUTE MYOCLONIC ENCEPHALITIS WITH LINGUAL HEMIPARESIS. [Lyon Médical, 1920, CXXIX, p. 453.]

The writers record the case of a Hungarian prisoner who was attacked by torpor, somnolence, and constant very short myoclonic shocks in face, limbs, and abdominal wall. There was defective elevation of eyeballs, sluggish pupillary reaction to light, none on accommodation. The tongue was protruded to the right, due to paralysis of the right hypoglossal nerve. No meningeal signs. Diminished knee-jerks, discrete bronchitis, and a temperature up to 42° C. on the evening of his death, which occurred ten days after the onset. Necropsy showed, on macroscopical examination, merely congestion of the nerve centers. [Leonard J. Kidd, London, England.]

Roubier and Richard. MYOCLONIC ENCEPHALITIS OF RAPID COURSE. [Lyon Médical, 1920, CXXIX, p. 452.]

The writers record three cases of encephalitis which ran a rapid course of four to twelve days, with invincible somnolence and torpor, absence or slightness of ocular signs, and the presence of short explosive myoclonic shocks in limbs, face, and specially the abdomino-diaphragmatic region, retention of urine and albuminuria, absence of meningeal signs, abolition of knee-jerks, diffuse bronchitis, free sweatings, and high fever which persisted after death. There was lymphocytosis of the cerebrospinal fluid. Necropsy showed acute congestion of the brain, especially the mesencephalon, and also pulmonary congestion. Microscopical examination showed intense inflammatory lesions throughout the nervous axis, especially in the pons and the locus niger, and in the subependymal gray matter. In one case there were small microscopical hemorrhages in the pons. [Leonard J. Kidd, London, England.]

4a. CEREBELLUM.

André-Thomas. CEREBELLAR SYMPTOMATOLOGY AND LOCALIZATIONS. [L'Encéphale, 1920, Feb. 10, Vol. XV, p. 114.]

As result of experiments on dogs and monkeys undertaken in association with Durupt, the author arrived at the following conclusions: Each cerebellar center connected with a member is subdivided into secondary

centers, each of which correspond to a segment of the member and control its motion in a certain direction (extension, flexion, etc.). Each of these centers has a double function, the hypersthenic for the agonists and hyposthenic for the antagonists, various disturbances, as *astasia*, *adiodokokinesis* (*Babinski*), *dysmetria* being referable to disturbances of the latter function. *Barany* showed the dependence of the sense of equilibration of members on the preservation of the relation between vestibular stimuli and certain cortex areas. In cases where the cortex factors were destroyed or their function suspended he observed the effects on the motions of the various members consequent on alteration of each particular cerebellar cortex area, in the form of spontaneous deviation in pointing, in directing the limbs, etc., and arrived at the following localizations: The center for moving the upper extremities downward is localized in the median extremity of the inferior semilunar lobe; that for the direction outwards of the superior member is at the external angle of the hemisphere, in the region of the superior or inferior semilunar lobes, the center for moving the hand outwards, in the most anterior part of the biventral lobe; back of this and farther outward in the same lobe is the center for elbow movements, and again farther in posterior direction the center for the shoulder articulation, and still back of this for the hip. The author offers a series of cases illustrating the advantages in topographical diagnosis which may be gained from the clinical observation of the movements of these joints, especially if there are other cerebellar symptoms pointing to the same localization. When the destruction of the cerebellum is extensive the disturbances of equilibrium of the body constitutes the most striking symptom, but symptoms resulting from inequalities of innervation, etc. (*dysmetria*, *astasia*, *asynergias*, etc.), are also of great symptomatological value. As the cerebellum contributes to the regulation of the intervention of the antagonists, it plays an important rôle in motor coördination, and for this reason it does not seem illogical to conserve the name of *ataxia* for all disturbances determined by cerebellar lesions. Deficiency of cerebellar function is replaced by intervention of the cerebrum, and for this reason, in cases of progressive lesions (especially in the olivo-ponto-cerebellar region), the cerebellar symptoms make their appearance only if the cerebrum, too, is involved. These circumstances explain the grave functional results from even very minute lesions of the central nuclei (*nucleus dentatus* and of the *tegmentum*) or of their afferent or efferent paths, as in these regions are stored or conducted in very limited spaces all the excitations coming from the cortex. Destructions in the inferior or superior cerebellar peduncles are rarely limited to these regions, hence their gravity. When subjected to analysis the cerebellar affections are not so mysterious as they appear to be at first view. Lesions of the cerebellum do not suppress motions entirely, at least in certain territories; those of the cerebrum are irremediable. [J.]

Damade, R., and Boisserie-Lacroix, J. RIGHT OTOGENIC CEREBELLAR ABSCESS WITH TOTAL HOMOLATERAL HEMIPARESIS. [*Gaz. Hebd. Sci. Méd. de Bordeaux*, 1919, XL, p. 410.]

A man, fifty-six, had had right otorrhea for thirty years. Twelve days before admission he had vertiginous attacks with falling, headache, dysarthria, and occasional vomiting. On admission, he was depressed, answers loud questions only, but slowly and correctly. Speech scanning and raucous; he splutters, and some words are unintelligible. He has total right hemiparesis, the facial palsy being of peripheral type. Bilateral hypotonia of limbs. He lies on his right side. No sensory changes; but reaction to prick is slow. Right tendon-jerks slightly diminished. Loss of pupillary reflexes in both eyes. Bilateral papillitis, more on left. Right ear deaf; mastoid tenderness. Now no vertigo, headache, or vomiting. Difficulty in swallowing, and is often choked up. No constipation. Cheyne-Stokes breathing. Pulse 100. Temperature 37.2° C. Cerebrospinal fluid under great pressure; moderate lymphocytosis; negative Wassermann. Diagnosis was a right cerebellar abscess pressing on the pons and on the seventh, eighth, and ninth nerves at their emergence. The right mastoid was trephined, but the patient died ten days later. Necropsy: In the anterior part of the right cerebellar lobe there was an abscess, of the size of a small nut, which compressed the right seventh, eighth, ninth, and tenth nerves; there was no cerebral lesion. The total right hemiparesis on the side of the aural affection pointed to pressure by the right cerebellar abscess on the pyramidal tract below the pyramidal decussation. [Leonard J. Kidd, London, England.]

Brouwer, B. CHRONIC DIFFUSE CEREBELLAR DISEASES. [*Neurol. Centralbl.*, 1919, XXXVIII, Nov. 1, p. 674 (4 Figs.).]

Brouwer describes a case of Thomas's lamellar atrophy of Purkinje's cells and also a pure case of Bielschowsky's centrifugal type of degenerative atrophy of the cerebellum. Both cases occurred in advanced life and had a toxic etiology. The first was a woman of sixty, whose father was epileptic. Her trouble began with fatigue in legs, and static and dynamic unsteadiness; now and then pain in micturition. Examination showed cerebellar ataxy in lower limbs and trunk. Doubtful hypalgesia in neck; no urinary incontinence. Occasional slight nystagmus on lateral deviation. Much arteriosclerosis. The ataxy in lower limbs increased so greatly that station and locomotion were impossible. Tremors of head and trunk on attempting to sit up in bed. Then a slow intention tremor, then ataxy of arms and dysarthria. Death seven months after onset. Necropsy: A sarcoma of pelvis. Slight leptomeningitis. Cerebellum slightly smaller than normal. Microscopically it showed atrophy of Purkinje's cells; the vermis was affected as well as the lateral lobes. The other cerebellar layers were normal. The cells of the nucleus dentatus were preserved, but many of its fibers were destroyed. The olivary complexes and the pontine ganglia were normal.

In Bielschowsky's centrifugal type of cerebellar atrophy the Purkinje cells are specially affected, while the other parts of the cerebellar cortex are little involved. The basket networks are preserved, but are quite empty, their Purkinje cells having disappeared. The case described by Brouwer was an alcoholic man, aged sixty. He had gait disturbances, giddiness, headache, but no vomiting, a left-sided abducens palsy. Typical cerebellar ataxy in lower limbs, only slight in upper. Tremor of head. Eye grounds normal. Horizontal nystagmus on looking to right. Dysarthria; speech monotonous, rather slow. Words badly articulated. Diagnosis pointed to the cerebellum; there was no evidence of disseminated sclerosis or syphilis. Cerebellar tumor was unlikely, because papillitis was absent, and also vomiting. The headaches disappeared under alcoholic abstinence. The left abducens palsy was probably of congenital origin, for there was no secondary contracture and no diplopia. So a diffuse cerebellar lesion was diagnosed. The giddiness lessened, but the cerebellar ataxy and speech disturbance increased greatly. In this case not only was there a toxic etiology, but the congenital left abducens palsy pointed to a congenital inferiority of the nervous system. [Leonard J. Kidd, London, England.]

Ingvar, Sven. PHYLOGENESIS AND ONTOGENESIS OF THE CEREBELLUM. [Folio Neuro-biologica, Vol. XI, No. 2, p. 205.]

From an extensive and detailed study of the evolution of the cerebellum the author here presents the results. It has long been established that the cerebellum in all vertebrata develops homologously, and, besides, the same histological structure is found universally throughout the animal kingdom. In the first part of his work the author shows that the morphological development of the cerebellum in all the higher species of vertebrata follows the same general lines, and the homology between the cerebellum of reptiles, birds and mammals extends even into the most minute details. In the second part experiments are described which confirm a theoretic conception of the cerebellum as an organ of equilibration, and this theory is further elaborated by the analysis of clinical effects of injuries of this organ. The function of the cerebellum may be thus defined; it is an organ serving the unconscious sense of "mass." It operates reflexly to oppose and overcome the gravity and inertia of the masses of the body for the purpose of preserving the equilibrium of the various mechanical systems of the same. These two terms, inertia and gravity, seem to be the most appropriate to express the idea desired to be conveyed, as they are the two principles which stand in contradiction to animal life. The perception of the force of gravity must constitute a fundamental function of life and one very important to it, for even plants have a special sense organ for the perception of gravity, the well-differentiated statolithic apparatus (Haberlandt, Nemeé). The author emphasizes the unity of function of the cerebellum, and finds therein an explanation of the fact that the cerebellar cortex, in contrast to the

cerebral, does not consist of different histological areas. Afferent stimuli received by all parts of the cerebellum cortex are always of essentially the same nature, as are also the efferent innervations which are projected from the parts of the cortex to the various regions of the body, whether to the locomotor musculature or to the speech apparatus. But while no areas of different structure are distinguishable, there is nevertheless a precise localization, not according to the segments of the body, but according to the synergies of the muscles necessary for equilibration, *i.e.*, according to the directions of falling and of motion of the body. Thus the question with which the author's work began, namely, how is it possible that man preserves the same "primitive" cerebellum as the lowest animal? is answered. It need no longer excite wonder that the crocodile has the same main parts in its brain as man, and that the Purkinje cells are nearly as delicately elaborated in the frog's as in the human brain. For we all obey the laws of matter and it is the same force which holds all creatures to the earth—whether crocodile, or frog, or the more complete and divine image—man, with his subtle and highflown hypotheses and theories. [J.]

Brouwer, B. AN ANATOMICAL RESEARCH ON THE HUMAN CEREBELLUM. [Psychiat. en Neurolog. Bladen, 1915, Nos. 1-2 (19 Figs.).]

In this paper, dedicated to Edinger on his sixtieth birthday, Brouwer gives a careful description of two cases of cerebellar atrophy. The first was in an old imbecile woman, and is an example of Thomas's lamellar atrophy of the cells of Purkinje; the second is one of a neocerebellar atrophy. In the first case the Purkinje cells are atrophied in both paleocerebellum and neocerebellum; the zona granulosa is slightly affected. There is diminution of the white fibers running through the dentate nucleus, and thinning of the intranuclear fiber net of the roof nucleus, while the cells of the intrinsic cerebellar nuclei are a little too small. But there are no changes in the cells of the pons, lower olives, restiform bodies, striæ of Piccolomini, or in the arciform fibers. In the second case the changes are limited to the lateral parts (neocerebellum); the atrophy is extreme, and the granular layer much damaged. The roof nuclei, globose, and emboliform nuclei are normal; the ventrolateral part of the dentate nucleus shows changes. The changes are more extensive on the right side. The lower olives are much affected, and the pons is not normal; on both sides the lateral nuclei, the nuclei of Deiters and of Bechterew, and those of the eighth nerve, are normal. From his study of these two cases, and much reference to the literature, Brouwer concludes that (1) in man the Purkinje cells send their axons to the intrinsic cerebellar nuclei; (2) the striæ of Piccolomini are all to be regarded as wholly caudally lying pontile fibers rising in the arciform nuclei; (3) the dentate nucleus is partly neocerebellar, partly paleocerebellar; (4) the lower olive is connected by its frontal pole, and by the medial part of its oral segment, with the phylogenetically older part of the cerebellum; its

remaining parts are connected with the neocerebellum; (5) the parolivary bodies (accessory olives) are connected only with the paleocerebellum; (6) there is a connection between the parolivary bodies and the contralateral restiform body; this is situated in the medial segment of the olivocerebellar tract; it is preserved in neocerebellar atrophy, while the remaining parts of this olivocerebellar tract disappear. This tract (tractus parolivocerebellaris) is medullated in the human fetus of forty-two centimeters, while the remaining olivocerebellar fibers are still nonmedullated. [Leonard J. Kidd, London, England.]

Jelgersma, G. THE FUNCTION OF THE CEREBELLUM. [Journ. f. Psychol. u. Neurol., Vol. XXIII, p. 137.]

The author gives a comparative anatomical description of the brain of cetaceans. Under the influence of aquatic life the central nervous system of these pelagic animals has undergone a very peculiar modification, especially in regard to the form of the cerebellum and in the development of the cerebellipetal and cerebellifugal fiber systems, the hemispheres having attained extreme development, while the vermis is relatively and absolutely reduced in size. In the cerebellipetal system those fibers are especially prominent which serve for deep sensibility and equilibration tonus sense, while skin sensibility, which is reduced in aquatic life, has a relatively unimportant conductive apparatus. Thus those qualities which stand in direct relation to voluntary movement and which are localized in the cerebellum have attained extreme amplification. From this extensive evolution of the cerebellum hemispheres and the paths connected with them in these animals it may be inferred that the sensible stimuli from the periphery go, for the most part, over the cerebellum, the direct sensible connection toward the cerebrum over the lemniscus being only developed in a rudimentary manner. The human brain also presents characteristic deviations of development. The enormous size of the hemispheres is due to three factors: the erect position of the body, the evolution of the coördinated movements of speech and of facial expressions, and, finally, the unsymmetrical (monolateral) movements of the extremities. The speech of adults is controlled to a much greater extent by the cerebellar apparatus, that by the acoustic centers, for the act of speech proceeds much more rapidly than it would if it were under the influence of the cortical acoustic sphere. Hearing is of course necessary for learning speech, but after the attainment of a certain skill a noteworthy reformation takes place and the government of speech by hearing is gradually replaced by regulation from the cerebellum, *i.e.*, by means of deep sensibility. By this means the control is withdrawn from consciousness, because deep sensibility works without consciousness. A like transformation takes place in all higher coördinations, as in piano playing, skating, etc. The author emphasizes the anatomical relation of the cerebrum to the cerebellum, one evidence of which is the pathologico-anatomical experience that the cerebellum spheres undergo atrophy if,

in the cerebrum, either the terminal or emerging points of the cerebro-cerebellar fibers are affected. The functions of the cerebellum are summed up as follows: The cerebellum is the center for the coördination of all voluntary movements. These coördinations are brought about by reflex effects from two organs of sense, the equilibration tonus organ and deep sensibility, and conscious sensibility has no participation therein. The cerebellum in man is principally under the influence of the cerebrum, the centripetal stimuli being conducted to the cerebrum and the returning stimuli reaching the periphery partly by way of the cerebellum. [J.]

Jelgersma, G. THEORY OF CEREBELLAR COÖRDINATION. [Journ. f. Psychol. u. Neurol., Vol. XXIV, p. 53.]

The author defines coördination as a quality common to all nervous processes by which coöperation for a definite purpose is rendered possible. The higher motor coördinations are to be regarded as complex, purposeful movements, undertaken by the proper muscles, at the proper time, with right force and rapidity. Higher coördination is always of cerebral origin, or at least a time had existed in the life of the individual when such movements were under cerebral control. In simple voluntary movements there is, beside the main impulse in the agonists movements of other muscles, the purpose of which is to prevent contractions not in keeping with the object aimed at. Every purposeful movement consists of a whole system of muscle movements which work together and correct each other, and the principle of correction is the basis upon which the whole system of coördination rests. "No muscle contraction as such," the author states, "is fitted to a purpose, either in time or space, and it is only transformed into a proper and purposeful movement when corrections set in from various sides. These corrections are the direct causes of coördination." The motor images are principally deposited in the cerebrum, in the gyrus precentralis, from which the pyramidal path springs. But it is only the simplest combinations which are here represented. In the lobus temporalis there must also be an area for functions of this sort, because cerebri-fugal impulses flow from it through Turck's bundle. In the frontal lobe it is probably the agranular areas which are connected with the higher motor functions. The processes which take place may be thus described: Motor impulses coming from the cerebrum flow through the fibers of the peduncle; a part of these impulses run directly through the pyramids to the anterior cornua of the medulla oblongata and thence to the muscles, being, however, only raw, incomplete, and dulled; a large part of the impulses branch to the cerebellum. These impulses take a longer path to the periphery, pass various ganglion neurones and arrive considerably later at the muscles. These are the corrective stimuli which are destined to revise those impulses from the pyramids which are out of keeping with the purposive action aimed at. Reaching the ganglion cells of the pons varolii, they pass through the brachium of the pons and the moss fibers to the nuclear layer of the

opposite hemisphere. The stimuli reach the Purkinje cells and these cells are informed of other contractions already caused by the pyramids in the muscles, because there are centripetal fibers from the medulla which convey muscle sense impulses to the cerebellum. As result of this mechanism corrective impulses proceeding from the Purkinje cells to the anterior cornua rectify erroneous movements. The cerebellum thus performs a two-fold function. On the one hand it is a ganglion of the cerebrum, conveying the higher motor images to the peripheral motor centers. In so far its function is dependent on, and its existence bound up in, that of the cerebrum. But beside this it has probably a reflex function which plays a rôle in correcting impulses that are elements of higher coördinations formed in the cerebrum. In so far the cerebellum is an autonomous reflex organ, but its activities are only exercised on the higher combinations of movements which are conveyed to it from the cerebrum and secondarily deposited there. [J.]

Jelgersma, G. THREE CASES OF CEREBELLAR ATROPHY IN CATS TOGETHER WITH REMARKS CONCERNING THE CEREBRO-CEREBELLAR CONNECTING SYSTEM. [Jour. f. Psychol. u. Neurol., Vol. 23, p. 105.]

The brains examined were from three cats of the same litter. They had manifested obvious disturbances of coördination of all voluntary movements. The macroscopic examination showed an extensive atrophy of the entire cerebellum; the microscopic, a very considerable disappearance of the nuclear layer and quantitative and qualitative changes of the Purkinje cells, all due, in the opinion of the author, to congenital agenesis. In the pons there was extreme atrophy of the crura cerebelli ad pontem and a decrease of the size of the cells of the basal portion. The author draws the following conclusions: the nuclear cells of cerebellum and the Purkinje cells are functionally connected, the innervation of the Purkinje cells proceeding from the nuclear. The ganglion cells of the pons send their axis cylinders to the crossed side of the cerebellar hemisphere, where they end as moss fibers in the nuclear layer. Between the cerebrum and cerebellum is a system interposed in the cerebri-fugal conducting path, the separate members of which, beginning with the cerebrum cortex, are: cerebropontile fiber bundles, the pons ganglia, crura cerebri ad pontem with decussation in the raphé, the nuclear layers of the cerebellum. From both comparative-anatomical and pathologico-anatomical experiences the author draws the conclusion that the olivary bodies of the medulla oblongata also form an intercalated station between the cerebrum and cerebellum. The axons from the olivary cells go by way of the corpora restiformia to the cerebellum and terminate, analogously with the pontocerebellar fibers, in the nuclear layers of the cerebellum. The difference in the endings is merely one of location, the pontile fibers tending principally toward the hemispheres, the olivary toward the vermis. Contrasted with these pontocerebellar and olivocerebellar fibers both terminating in the moss fibers of the nuclear layer, are those paths which

connect the cerebellum with the peripheral nuclei in the medulla oblongata and spinal cord. These end in the molecular layer in the climbing nerve fibrils on the dendrites of the Purkinje cells. This difference in endings has its correlate in the different functions of these two systems. The innervations flowing from the peripheral nuclei to the cerebellum are the stimuli of deep sensibility and of the equilibration tonus organ. They are elaborated in the cerebellum and so far as they are not translated into motion reflexly are conveyed further on centripetal paths to the cerebrum. Here they are translated in an unknown manner into kinetic images, or are so transformed that they correct already existing kinetic images, and these innervations then flow in cerebri-fugal direction through the pyramidal system over the cerebri-fugal cerebro-cerebellum paths to the cerebellum, this conduction taking place by means of that system which terminates as moss fibers in the nuclear layer. The climbing fibers, therefore conduct through the cerebellum the peripheral cerebri-petal stimuli, the moss fibers, on the other hand, conduct the cerebri-fugal stimuli going to the periphery. The functions of the climbing fibers are purely sensory, those of the moss fibers are motor. Notwithstanding this great difference in function both systems are of cerebellopontile nature, that is they have their terminal station in the cerebellum and conduct to that organ the stimuli which originate in other regions of the central nervous system or in the periphery. [J.]

Kohlhaas. MALFORMATION OF THE CEREBELLUM IN A SOLDIER.
[*Deutsche Ztschr. f. Nervenhe.*, Vol. LXI, p. 360.]

In a soldier twenty-four years of age who died suddenly in the field hospital from wounds the cerebrum was found to be entirely normal, and the left half of the cerebellum and the vermis as well as the crus cerebelli and fourth cerebral ventricle showed nothing unusual, but the right half of the cerebellum was only one third as large as the left. The whole construction of this side was just like the other side but on a smaller scale. Neither on the surface nor on the cross section were any cicatrices or softenings visible. In the occipital region the occipital fossa on the right side was only one third as large as on the other side, corresponding to the general structure. There were no other deformities or defects of development in the body, such as spina bifida, etc., which so often accompany deformities of the brain. The author ascribes the peculiarity to a congenital deformity, to an agenesis, with accompanying disturbance of development, of unknown cause, beginning in fetal life. A focal disease in fetal life or in early childhood was excluded in the absence of cicatrices. Of this considerable deformity of the cerebellum the young man had never shown any symptoms, no disturbances of coördination, ataxias, asynergias, etc. He served two years in the field in the front lines and was highly esteemed for his bravery and skill. The only symptom of which his family had any remembrance in his life was that when he was two or three years old he had the habit of moving

his head backward and forward. The fact that symptoms were absent may be due to a circumstance to which Oppenheim calls attention, namely, that where disease processes of the cerebellum develop gradually they may proceed without any apparent signs. Further Edinger states that diseases of the vermis lead to disturbances of equilibrium—those of the hemispheres to asynergias. Coördination of the muscles could be re-learned and new paths could be used for them but preservation of equilibrium, on the other hand, depends on the circumstance that the body is divided into two equal halves and therefore the loss in one hemisphere could not be compensated for by activities in the other half alone. This case illustrates the fact, therefore, that a congenital defect of one half of the cerebellum, where the vermis is intact, or even a defect that is very early acquired, may exist without noticeable symptoms and without disturbances of equilibrium (this soldier was a very good bicycle rider). [J.]

Brun, R. CONTRIBUTION TO THE KNOWLEDGE OF ANOMALIES OF DEVELOPMENT OF THE CEREBELLUM. [Schweizer Archiv f. Neurol. u. Psychiat., Vol. III, No. 1, p. 13.]

The purpose of the author is to present the morphology, the nature, and the dynamic causes of anomalies of development of the cerebellum, from observations on extensive material, having special regard to the normal ontogeny and phylogeny of the organ. The anomalies of the cerebellum are all partial phenomena of general anomalies of the germ cells and are therefore not of secondary pathological, but of primary endogenous nature. They correspond to general failures of the organism to attain to certain standard phases of normal ontogeny, but the reason for the special morphological results are often obscure. The primary pathological (teratogenic) moment which leads to disturbances of normal development is the hereditary moment, in the sense of a so-called congenital pathological tendency. On this basis the hereditary or familial diseases of the cerebellum develop (Marie's disease, Friedreich's disease, etc.). The defects of histological development which are invariably found in these chronic diseases—general hypoplasia, persistence of embryonic cortex layers, imperfect evolution of certain elements, such as the Purkinje cells, and even tectonic perversions, prove conclusively that these diseases are due to disturbances of ontogenic evolution. A second moment leading to anomalies of development is the toxic. The immediate effect of the toxic injury to the germ cell is expressed in all cases primarily as a check on the evolutionary development in conformity with endogenous laws which constitute the hereditary mnemonic factor (Semon). This check becomes apparent in the omission of various constructive elements in the germinal layers and in a reduction of vitality of the elements, leading to lessened power of cell division, and of capacity of cells to migrate and to differentiate. Different types of developmental checks lead to definite types of malformation. True primary agenesis

of the cerebellum takes place only where there is severe general check of development of the entire medullary foundation. Where there is less severe injury the paleocerebellum may develop almost normally, there being only elective "phylogenetic aplasia" of certain systems, limited to those parts which are of latest phylogenetic appearance. Thus it is proved that those parts which in the evolution of the race make their appearance last, are the last to be developed ontogenetically. The capacity of certain elements or systems of elements to differentiate to their fullest extent, not only histologically, but tectonically, is often found preserved in the midst of general developmental imperfection. In the opinion of the author this extensive capacity of independent organ evolution under wholly abnormal mechanical conditions, proves that the essential impulses which give rise to special developmental tendencies and tectonic formations in the brain do not derive their energy from external conditions (*i.e.*, from the mechanical, chemical, etc., conditions of the environment), but from an inner dynamic moment. It is the successive complexes of the original hereditary mnemonic tendencies of the germ cells which, following independent laws of phasogenic or chronogenic development, effect the evolution of the embryo and of the specific morphological constructions which belong to the different organs and to the different normal species. The old embryological theories which regarded the different constructions to be exclusively due to actual physical and mechanical conditions must therefore be abandoned because they are in contradiction with the discoveries of teratology. [J.]

5. BRAIN — MENINGES — BRAIN.

Reh, T. TWO SPECIAL NERVOUS FORMS OF INFLUENZA. [Arch. de Méd. des Enfants, 1920, XXIII, p. 363.]

Reh describes two cases of particular nervous forms of influenza observed at the end of the winter epidemic (Jan.-Feb., 1920), viz.: (1) a pseudotuberculous influenzal meningitis, and (2) influenzal meningism with cerebellar symptoms; both children gradually recovered. The first, aged seven years, was weak and wasted, had frequent headaches, and vomited occasionally; there was evidence of tracheo-bronchial adenopathy. A week later, general convulsions and meningeal symptoms appeared. At the height of the illness the condition resembled that of a tuberculous meningitis, with hyperalbuminosis and lymphocytosis of the cerebrospinal fluid. Gradual recovery in five weeks, with return of the spinal fluid to normal. The second child, aged seven, had, in the course of influenza, violent delirium, static ataxia, and retropulsion. She had early otitis media needing paracentesis; meningeal symptoms next day. Slight fever with ambulatory, noisy delirium, static ataxia, and easily produced retropulsion; exaggerated tendon-jerks; cerebrospinal fluid under pressure. Three days after admission the delirium gave way to somnolence. No ocular signs. Two days later the static ataxia and retropulsion disap-

peared. Four days later sciatic pains on right side, with signs of sciatica. Complete recovery in six weeks. Apparently, cerebellar symptoms are rare in meningism. [Leonard J. Kidd, London, England.]

Brouwer, B. MENINGO-ENCEPHALITIS AND THE MAGNUS-DE KLEIJN REFLEXES. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, Vol. XXXVI, p. 161.]

The author describes the case of a child of thirteen months with extreme rigidity of the extremities and heightening of reflexes together with a very perceptible neck reflex. This is the reflex discovered by Magnus and de Kleijn, in 1912. When the head was turned to the right so that the occiput was toward the right and the face toward the left there was extension of the left arm and leg with exaggerated tonus, while the two other extremities remained bent; if the head was turned toward the left so that the occiput was on the left and the face turned to the right there was extension of the right extremities and slight bending of the left, that is to say the tonus is in the extremities of that side of the body toward which the face of the child is turned and the reduction of tonus on the side of the occiput. When with the child in horizontal position the head was bent forward and backward (ventrally and dorsally) there was neither flexion nor extension. The child died with all the signs of acute meningitis. It was found by the anatomical examination at the autopsy that a meningo-encephalitis had destroyed the medulla of the cerebellum to a great extent. Further the cerebellar cortex had been attacked and large inflammatory lesions were found in the ventral section of the pons. The author emphasizes the significance of this case from a physiological point of view. The Magnus-de Kleijn neck reflex was elicited notwithstanding the nearly entire destruction of the cerebellar cortex and consequently in the absence of cerebellar function. Contrary to the general opinion of the powerful influence exercised by the cerebellum on the tonus of the body, this new group of reflexes demonstrates that reflexes undoubtedly influencing all four extremities are active after destruction of the cerebrum and all clinical and anatomical facts show that its intervention is superfluous to their production. Another point of interest was that the inflammatory degenerations were limited to the parts of the brain which are of later evolutionary development, illustrating anew the principle that those bodily structures which are phylogenetically younger are the first to succumb to destroying processes. [J.]

Méry, H., and Girard, L. CEREBROSPINAL MENINGITIS AND BACTERIOTHERAPY. [*Bull. de l'Acad. de Méd.*, Nov. 11, 1919, p. 284.]

These authors claim that, while serotherapy is always the therapeutic method of choice in cerebrospinal meningitis, it is insufficient in a certain number of cases, especially when there is any dural complication, when the meningitis is due to an atypical germ, when the serum is

badly borne, and when the meningitis tends towards a chronic course with or without meningococemia. They record the case of a child of twelve years, suffering from severe and prolonged meningococcal infection, complicated by septicemia and otitis interna, in whom serotherapy was badly borne. Three weeks after the onset an autovaccine therapy was used with the best results, recovery taking place with the sole residue of deafness in the ear affected. In this case, while the specific intraspinal and intramuscular serotherapy improved the patient's condition, the septicemia became intermittent. Under the influence of the autovaccine the general and local signs quickly improved. The writers recommend that, while serotherapy should be used early in the disease, it is wise to make cultures of the cerebrospinal fluid or the blood to isolate the infecting germ, and to make an autovaccine whenever possible. [Leonard J. Kidd.]

Boisserie-Lacroix. TUBERCULOUS MENINGITIS. [Gaz. Hebd. des Sci. Méd. de Bordeaux, January 11, 1920.]

The author reported recently to the Bordeaux Anatomico-Clinical Society the case of a man admitted to hospital for a cerebrospinal meningitis without any paralysis or muscular atrophy. Lumbar puncture, performed on many occasions, gave constantly a clear fluid under tension, free from microbes, with a marked predominance of polynuclear cells. During an intraspinal injection he was seized suddenly with severe general symptoms and a total left hemiplegia accompanied by paralysis of the right oculomotor nerve; these symptoms rapidly disappeared. Necropsy revealed a tuberculous tumor in the right bulbar olivary body, and also one in the left internal capsule. The case is interesting by reason of the presence of polynucleosis of the cerebrospinal fluid in a tuberculous meningitis, the presence of multiple tuberculous tumors of the nerve centers, and by the abnormal form of the bulbar syndrome which, latent during almost the whole course of the affection, appeared manifest only during the giving of an intraspinal injection of serum. [Leonard J. Kidd.]

Dumas, A., and Madinier. ASEPTIC PURIFORM MENINGITIS, THE SOLE SIGN OF A LATENT FRONTAL LOBE ABSCESS. [Lyon Médical. Nov., 1919, p. 556.]

These authors report to the Medical Society of the Lyons Hospitals the case of a man, aged thirty-four, who was admitted with meningeal symptoms of abrupt onset, viz., severe headache, very marked Kernig's sign, and sub-febrile temperature. Lumbar puncture gave issue to a thick fluid, not under tension, containing very abundant intact polynuclears and some epithelial cells; no bacilli by direct examination; little marked albuminosis; hypoglycorrhaphy (diminution of sugar in the cerebrospinal fluid); cultures taken on three occasions were negative. As a rule, these aseptic puriform meningitides are benign; but this case grew progressively worse. Necropsy revealed an abscess in the right

frontal lobe, of the size of a large nut; it contained very thick yellow creamy pus, and was certainly of older date than the acute meningitis. [Leonard J. Kidd.]

v. Monakow, C. DEVELOPMENT AND PATHOLOGICAL ANATOMY OF THE RHOMBOIDAL PLEXUS (Rautenplexus). [Schweizer Archiv f. Neurol. u. Psychiat. 1919, Vol. V, No. 2, p. 378.]

The lively discussions which recently have arisen concerning the nature of instinct and feeling and the rôle of the inner secretions in relation to the emotions and appetites, have given impulse to the study of the finer morphology and the evolution of the secretory organs. The view that the neuroses and psychoses are caused by disturbances in the sphere of instinct and its substratum and not by affections of orientation is constantly gaining adherents. For this reason the author undertook the study of the choroid plexus, which may be regarded as a physiological membrane designed for the biological protection of the brain. He determined with considerable certainty that the plexus choroidei of the hemispheres shows structural abnormalities in certain mental diseases (especially in schizophrenia), and now turns attention more especially to the rhomboidal plexus (plexus choroidei laterales and mediales of the rhomboidal fossa). From study of embryonal formations he was able to establish that the two ventricular chambers contained in the rhomboidal plexus constitute an entirely closed off space, nowhere in connection with the arachnoid space of the oblongata, and he found neither the foramen Magendie nor the so-called foramen Luschka (the communication outwards assumed for the lateral recess of the ventricle). Of great importance from a clinical or psychologico-pathological point of view is the relation of the lateral recess to the tuberculum acusticum, the ganglion ventrale acusticum and the lateral walls of the flocculus. The lateral caudal part of the tuberculum acusticum with the ganglion ventrale form the lateral wall of the recess and both are also without any hiatus covered with ependyma cells, so that they are in many places in direct contact with the vascular tufts, are washed by the liquor ventriculi, while the median wall and the anterior part of the ganglion ventrale and the basal part of the tuberculum acusticus lie outside of the recess, are free from ependyma and are directly covered by the pia (which is very rich in vessels) or by the arachnoidea. Thus the lateral parts of the acusticus region depend chiefly for nutrition on the liquor ventriculi (supply of materials or ferment substances for the function): the medial and anterior parts, on the contrary, receive nutrition from the arterial blood (supply of oxygen, salts, etc.). The supply of ventricular fluid to the regio acustica, then, and, perhaps to a small part of the vestibularis, comes from the lateral recess of the fourth ventricle and it may be assumed with probability that from this point there is also communication with the labyrinth. From a pathologico-anatomical point of view the author was principally interested in the disease forms where, beside

general degeneration in the hemisphere plexus there were also similar changes in the rhomboid region. He considers it possible that an accumulation of injurious substances in this region would cause a series of toxic effects that would find expression in troublesome sensations, especially where there were concurrent disturbances in the cortex. These eccentric sensations (being under the influence of electricity, etc.), would be attributed by the patient to peripheral disturbances, and (where there was agglutinated or fragmentary causality, as in schizophrenia) would lead to somatic hallucinations, hearing of voices, insane ideas, etc. All arising (intermittently it might be) from pathological changes in the chemical composition of the ventricular fluid, specially secreted in the rhomboid region. [J.]

Kitabayashi, S. HETEROTOPY OF THE PLEXUS CHOROIDEI. [Schweizer Archiv f. Neurol. u. Psychiat., 1920, Vol. VI, No. 1, p. 154.]

The author in examining the plexus choroidei of a schizophrenic, a young man twenty-nine years of age, discovered interesting misplacements of parts which, he states, have never hitherto been described. These heterotopies were of three sorts: 1. A wedge shaped projection of the flocculus in a dorsal direction at the level of the tuberculum acusticum in the space between this latter and the flocculus. This projection consisted of a tissue poor in cells which seemed to correspond to the medulla of the cerebellum with a layer of nuclear cells similar to the cerebellar nuclear layer. This outgrowth of the flocculus contained a heterotopic formation of the plexus choroidei, characteristic villi appearing in the middle of the nuclear layer and, in part, in the medullary. 2. A second structural deviation was in the oral part of the cornu Ammonis near the fimbria, consisting of two abnormal spaces, one in the form of a figure eight and the other irregularly round which were filled with vascular tufts from the plexus choroidei. 3. A third misplacement was in the medullary region nearly midway between the corpus geniculatum externum and the nucleus caudatus, on the ventricular wall about at the level of the taenia semicircularis, consisting of a bulging of the plexus choroidei into the brain substance. This is a peculiar form of heterotopy, not so much a displacement of the choroid plexus as an invagination of the vascular tufts in an unusual direction. These abnormalities are assumed by the author to be due to disturbances of development in various embryonal stages. The third form he assumes to have originated in a late embryonal state in such a way that the tufts which had already attained normal development bent out into the region of the taenia semicircularis. He accounts for the formations belonging to the choroid plexus in the wedged shaped outgrowth of the flocculus and in the cornu Ammonis by supposing that the ependyma mother cells for the plexus choroidei were at an early stage of embryonal development carried out into the primitive layers for the cerebellum and cornu Ammonis where they developed. These heterotopies were of nearly normal structure for

the plexus, consisting of vascular tufts cells, vascular loops and perivascular spaces with characteristic connective tissue, and this structure was retained uninfluenced by the surrounding parts. [J.]

Landau, E. THE EVOLUTIONAL MECHANISM OF THE ISLAND OF REIL. [Schweizer Archiv f. Neurol. u. Psychiat., 1920, Vol. VI, No. 1, p. 170.]

A new view of the evolutional mechanism of the Island of Reil is presented. Landau believes that the formation of opercula in connection with the island is not brought about by the more intensive development of the cerebral cortex while the island remains in a primitive condition, for the fissure of Sylvius according to Landau is a sulcus dependent on the evolution of the cerebral pallium. The main proof that the island has originated through a general developmental mechanism, and in fact through a general flexion of the fore-brain, the author sees in the circumstances that not only the medial and lateral surfaces of the telencephalon but the corresponding part of the rhinencephalon as well, participate in this process. This curvature of the rhinencephalon and hemispheres reaches its highest point in the primates where that part which in primitive brains is known as the lobus pyriformis region becomes the medial part of the frontal poles of the temporal lobe. The effect of the curvature of the cerebrum on the rhinencephalon can already be observed in the macrosomatic animals. Landau thus finds that to the flexure which has already been described in the embryonal brain, another bending process must be added which may be designated a fore-brain curvature, the stages of which may be followed by a comparative anatomical study of the gradual evolution of the insula together with the concurrent flexion of the rhinencephalon. [J.]

v. Stauffenberg. CONTRIBUTION TO THE KNOWLEDGE OF AGNOSIC AND APRAXIC SYMPTOMS. [Ztschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXIX, p. 71.]

The author describes seven cases: 1. A case of true agrammatism upon the foundation of a functional disturbance in the central motor speech apparatus, with the result that the more recent and finer details of language were lost. 2. A case of amnesic aphasia with a lesion on the right side, in a right handed individual, which the author explains as follows: the lesion on the right side involving the entire right speech region caused a diffuse disturbance of innervation of the left speech region and had as consequence defects of inner speech and weakening of the entire higher performances, figuratively speaking, a loosening of the connection of word and idea, which gave a foundation for a slight agnosia. 3. A case of complicated cortical aphasia with anatomical findings, which furnished the following important facts in regard to localization: a considerable destruction of the Broca region produced no motor-aphasic or dysarthritic phenomena; complete destruction of the anterior lenticular

nucleus and the pre-lenticular and supra-lenticular region was without influence on motor-speech (in contradiction to Mingazzini); the complete interruption of the homolateral paths between sensory and motor speech regions was not followed by motor aphasia. 4. A case of sensory aphasia with rapid recovery where there was destruction of the nucleus region of the left sensory speech area, showing that the disturbance of the central region of sensory speech need not necessarily produce greater defects of sensory speech performance than are observed in lesions in peripheral nerves of sensory speech. 5. A case of mind-blindness with anatomical finding which could be ranged with other examples showing the importance of the left parietal lobe for adequate mental performances. 6. A case of sympathetic apraxia and tactile agnosia with anatomical findings, of which the feature of special interest was the peculiar total tactile agnosia of the left side without any lesion corresponding thereto, leading to the assumption that, at least for some individuals, the higher elaboration of the tactile impression is localized in the left hemisphere. 7. A case of apraxia with anatomical findings from which it could be assumed that the gyrus supramarginalis possesses for tactile performances the same significance which the Wernicke region possesses for motor speech, being the place for depositing the complicated memory images gained from the collaboration of the various senses and controlled and corrected from the sense centers. [J.]

III. SYMBOLIC NEUROLOGY.

2. PSYCHOSES.

Bouman, L. THE HISTOPATHOLOGY OF THE PSYCHOSES. [Psychiatr. en Neurol. Bladen, 1918, Nos. 1 and 2.]

The changes resulting from dementia paralytica under discussion are those of the blood vessels and the occurrence of rod cells. The endothelium of the blood vessels forms young capillaries, which grow along the wall of the vessels from which they originate. The rod cells frequently originate from glia cells, sometimes they form a center for the glia fibers; they are often to be considered as adventitial or endothelial cells of obliterated vessels. Plasma cells are found not only in cases of dementia paralytica, but also in various other brain processes. The cells with two nuclei often occur in the lamina gigantopyramidalis in cases of dementia paralytica, a fact to which, perhaps, too much importance is attached in the case of juvenile paralysis (in the Purkinje cells). In juvenile paralysis spool-shaped bodies are found in the molecular and granular layer of the cerebellum, connected by means of an extension to the Purkinje cells. These bodies, which we called torpedoes, were also found by the writer in cases of dementia senilis, arteriosclerosis cerebri, Huntington's chorea, and in dementia paralytica with acquired lues. Probably they are exclusively degenerative products. In delirium acutum, Nissl's "acute Veränderung" (acute change) is found in the ganglia cells, the axis cylinder extensions are clearly to be seen, the

nuclei appearing in the shape of big vesicles with distinctly colored "Gerüst." Incrusted products are found and a breaking up of these into small particles, connected with the capillaries. The Cajal method for glia tissue gives interesting patterns in which a close relation is found between glia cells and ganglia cells, on one hand, and glia cells and the vessels, on the other. [Author's abstract.]

van Valkenburg, C. J. 1. WILL AND PASSION. [de Gids, 1918, Amsterdam.] 2. SENSATION AND PERCEPTION. [de Gids, 1917, Amsterdam.]

Two biopsychological essays founded on the phylogenetic development of the central nervous system and the increasing complication of motor response to different stimuli.

van Valkenburg, C. J. FREUDISM FOR EVERYONE. [de Gids, 1918, Amsterdam.]

A critical essay on the Freudian theory of dream interpretation. The writer admits the large rôle played by sexual factors in human life and nervous diseases, showing at the other hand the logically erroneous generalization which enables Freud to underly well-known and phantastically interpreted (would be) sexual data to the reconstruction of dreams and other subconscious phenomena.

Vaertling, Mathias. CLIMACTERIC AND AGE IN MEN AND WOMEN. [Neurol. Centralbl., May 1, 1918, No. 9, Vol. XXXVII.]

The opinion seems to prevail pretty generally in science that there are certain differences in the climacteric in men and in women. A climacteric in men is wholly denied, or, at least, it is claimed that this period is less dangerous for men than for women, or it is maintained that the sexual involutonal period occurs at a much more advanced age in the former than in the latter. Kurt Mendel in 1910 brought forward practical observations contradicting these differences in the sexes and confirmatory of the view that there is a *climacteric virile*, a period when the active sexual life of men comes to an end, just as it does in women. Mendel's views, like all new theories, met with opposition, but the author thinks there is an infallible test by which they may be proved or refuted, namely, by comparing the relative mortality statistics of males and females. From such a comparison it becomes apparent that the climacteric is not only just as dangerous a period for men as for women, but that it is a far more critical one, for at no other period of life does the death rate of men exceed that of women to the same extent as between the ages of forty-five and sixty. Prinzing and Gaupp offer facts in support of this view. The former states that in the fortieth year of life the mortality of women falls far below that of men and that it is the male sex which is most affected by the climacteric. According to Gaupp, one hundred and forty men die to every one hundred women at the age of forty-five years. The mortality of men is highest at this age, which is

evidence that the male climacteric takes place much earlier than was formerly supposed. Different writers assume different ages between forty and sixty years as the normal age for the climacteric, but the author thinks that the material from which they formed their opinion varied with circumstances and that the age at which clearly recognizable changes take place varies in different individuals, being conditioned by the constitution and the milieu. In a previous article the author showed that the beginning of the menopause in women depends very greatly on the nourishment of the individual. *Climax retardata* is often observed in women in good circumstances of life; they sometimes attain fifty-eight or sixty years before any irregularities in menstruation set in. In badly nourished women the menopause occurs much earlier. It is highly probable that the age of cessation of sexual functions in men also depends greatly on nourishment. The degree of sexual activity also plays an important rôle in determining the beginning of the climacteric. An inactive sexual life in women brings about an early cessation of function, while the opposite is the case with men. A further proof of the existence of a climacteric in men is the circumstance that the quality of the offspring deteriorates with the advancing years of the father. In women, again, the opposite phenomenon is observed. Some years ago Valleteau de Monillac sought the anatomical grounds for the male climacteric and found that at the age of fifty years a clearly perceptible pigmentation of the interstitial testicle cells begins, which, with a certain degree of sclerosis, characterizes the senile involution of the generative glands. The fact revealed by statistics that men are affected to a much greater degree than women by this critical period of life is confirmed physiologically. This circumstance is probably overlooked because such great importance is ascribed to menstruation. In reality the function of the generative glands is a much more important function in the sexual sphere, and menstruation is only an accompanying phenomenon of the function of these glands—a fact proved by the absence of menstruation in the higher orders of animals. A comparison of the manner in which the sexual processes cease in the two sexes in advancing age also reveals the more deleterious effects of this phase in man than in woman. Women, long before the menopause, have experienced interruptions of the sexual function (during pregnancy, etc.), and are accustomed to various transitions from active to inactive periods, so that the final cessation comes without any psychic ill effects. The loss of power of procreation strikes both sexes alike, but from the manner in which civilized society is organized men suffer more deeply from this cause than women. Women have usually ceased reproductive activities for some time before the appearance of the menopause, and the final loss of reproductive power, also, produces no psychic alteration, while in men, who marry much later in life, and who are supposed to have a much longer youth, a conflict between the inability to reproduce and the longing for fatherhood is more likely to

arise. The author says the theory that men have a longer youth than women is a dream and not even a beautiful one, that it is not years which make age, but the manner in which the years are lived. [J.]

Stöcker, Wilhelm. CONCERNING THE GENESIS OF HALLUCINATIONS. [Zeitsch. f. d. ges. Neur. u. Psych., July, 1919, Vol. L.]

Considering illogical the view that hallucinations are caused by processes of perception or similar processes, the author attempts to give a more consistent explanation. Instead of defining them as "sense perceptions without corresponding external stimulus," he proposes the definition: "Intrapsychic processes which, from a subjective error on the part of the patient, are mistaken for perceptions arising from objects affecting the senses." Only when the definition is thus modified is the author in a position to account for these pathological processes without coming into conflict with the views of modern science on psychic processes. His first step is to show, by noting transitional phases, that the pathological phenomena are only exaggerations of what takes place in ordinary mental processes. Illusions may be observed in normal individuals under affective conditions, of fear or anxiety, for instance. A person overcome with fear mistakes a bush in the road for a robber, etc. There is scarcely a psychiatric writer who would maintain that falsification of perception is the primary process in such cases; it is the affect, the emotion, which is primary, leading-secondarily to the perception of ghosts, robbers, corpses, etc. Proceeding to hallucinations the author shows by numerous inductive examples how the same sort of falsification prevails in hallucinations as illusions. There are illusions in which it is impossible to say whether the false conception takes place at the very moment the original true perception arises in the senses or later. Where this false interpretation of the perception by means of memory images which do not belong to it is instantaneous, the illusion becomes a hallucination. This instantaneous falsification, together with the feeling that the intrapsychic image comes from without, is the keynote of the author's explanation of the genesis of hallucinations. To prove that this tendency to regard intrapsychic occurrences as coming from without is not a mere theoretical assumption, the author shows that it has its analogy in a well-known psychopathological process—that is to say, in those falsifications of memory which set in *a tempo*, not only under neuropathic, but also in certain normal conditions, in the sense that the patient or normal individual immediately believes, on finding himself in a certain situation, that he has had the same experience before. This is a falsification of memory which makes the individual believe that the new event already belongs to his experience; in hallucinations the feeling of the patient that the events do not belong to the circle of his ideas, but come to him from without, is a similar falsification. In some instances the patients believe that these thoughts which seem foreign to them are placed in their mind by thought transference, while in other instances visual or verbal images seem to

come through the senses, *i.e.*, hallucinations are formed. The author is of the opinion that this difference may be explained by diversities in the original tendencies of thought of the individuals. Those who think in visual or verbal images with strong sense component incline to falsification of the hallucinatory type; those who think in images with less emphasized sense component arrive at the insane belief that thoughts are transferred to them. Ideas become hallucinations because an emotional component in the psyche is opposed to the component which gives rise to the hallucinatory images, and they therefore seem to come from beyond the mental circle of the individual. They resemble compulsory ideas; only these latter seem to arise from some foreign element in the psyche; the hallucinations, on the other hand, from some heterogeneous cause outside of the psyche. [J.]

Eager, R. THE EARLY TREATMENT OF MENTAL DISORDERS. [Lancet, Sept. 27, 1919.]

The author, R. Eager, who was selected by the War Office in London to take charge of 1000 beds at The Lord Derby War Hospital, Warrington, the largest psychiatric section opened by the British military authorities during the war, points out that at the end of two years' work in this capacity he found the recovery rate was 56 per cent in comparison with 32 per cent for civil institutions in England. No discrimination was exercised as to the type of case admitted, and the number of cases of general paralysis alone came to 197, which is of importance when taken into consideration with this recovery rate. There was nothing very noticeable to mention in the way of mental symptoms presented to differentiate the cases from those seen in prewar experience, and the author has already given a clinical survey of the varieties of mental conditions met with in an article in the *Journal of Mental Science*, July, 1918. The outstanding point which Dr. Eager lays emphasis on is that cases arrived under appropriate treatment at the earliest possible moment without the stigma of certification and delay which is consequent upon such a procedure. He considers that the higher recovery rate is in great measure due to this cause, but also points out the importance of having a very much larger medical staff than is customary in most civil institutions in that country if any attempts are to be made at individual attention and psychotherapeutic conversations which he advocates as being of great importance in helping the patient to make a satisfactory readjustment in psychoses of recent origin.

Cases were retained for treatment for nine months, at the end of which period, if there were no signs of marked improvement, they were certified and transferred to the civil institution to which they appeared to be chargeable. In the case of epilepsy, general paralysis, and cases who had been resident in an asylum prior to enlistment in the army, certification was resorted to as early as possible after the presence of a mental condition justifying this had been discovered. Everything pos-

sible was done to eliminate the chronic cases and to promote an atmosphere of cure in the wards of this large receiving hospital for early mental disorders, and at the end of the two years' period Dr. Eager shows that only 200 of the 1000 patients in hospital had been resident six months or over. We are glad to observe that as soon as possible after patients had improved sufficiently they were allowed the freedom of parole. Stress is rightly laid on the benefit derived by giving patients this privilege in the convalescent stage, and the author points out that although on an average 300 patients were daily enjoying this liberty for a period extending over two years, only one case with concealed delusions escaped detection. This reflects very great credit on the care which was exercised in examining each case, and it is on this, combined with sufficient experience of mental disorders, that the success of this method of encouraging patients convalescing from such maladies depends. We are satisfied that it is not compatible with any slackness or slipshod methods of examination, and consider that Dr. Eager has performed a service which should be of lasting benefit to mental science in demonstrating that with sufficient care and trouble the risks of this procedure, which would otherwise be very great, can be reduced to an almost infinitesimal minimum. Dr. Eager supports treatment of the psychoses in the early stages by suggestion, persuasion, and psychoanalysis, by which the physician uses active means to help the patient through his trouble to a favorable termination in contradistinction to the "rest in bed" treatment where no other efforts are made on the part of the doctor. Dr. Eager had the coöperation of ten medical officers working under him. Each of these was provided with a room where each patient could be examined privately and be encouraged to enter confidentially into conversations and disclose his feelings out of hearing of the other patients. The importance of this is an absolute necessity in any institution for the treatment of mental disorders does not seem to have yet been realized generally by alienists throughout the world, and we think Dr. Eager is right in drawing attention to this fundamental principle. He advocates the opening up of "receiving hospitals" and psychotherapeutic clinics, as distinct from "asylums," for the active treatment of mental diseases in their early stages, and does so with an extensive knowledge and experience of the power of suggestion upon the mind of man. He considers that "the atmosphere of cure" is of prime importance in treating such cases, that everything must be done to inspire the patient with hope from the moment he enters the building, and that no time must be lost by the physician to gain the patient's confidence.¹ We agree with him that to place such a patient in the same building, and we regret to feel that in some asylums even in the same ward, as patients who have been resident there for

¹ He urges an alteration of the Lunacy Laws in England in order that treatment may be given to cases of mental disorder at a time early enough for it to be of benefit and it is likely that some change will be soon made in this respect.

twenty or more years, is not using the powerful force of suggestion to the advantage of the patient, and that it must have a harmful instead of a beneficial effect. Here also bad habits are just as likely to be imitated as good, indeed, more so. In order to rid the wards of this harmful factor chronic cases were certified as soon as possible, and the total so dealt with represented 9 per cent of the admissions. Idleness was discouraged. Any man having a special trade in civil life was encouraged to work at this in the hospital workshops after his convalescence had become established. On the other hand, for the purpose of treatment in cases with exhaustion symptoms absolute rest in bed was insisted on. The importance of a liberal diet and the advantage gained by having specialists in all other branches of medical science resident in the hospital, which was a general hospital of which 1000 beds formed only one section, are described.

Good work seems also to have been done in introducing a routine examination of the blood and CSF by the Wassermann method in all cases in which there were any reasons to suspect G. P. L. in the early stage, and we feel that this is far too infrequently carried out by those in whose hands is the responsibility of directing the work of present-day mental hospitals. This all tends to emphasize the importance of any institution dealing with early cases of mental disorder being in close association with an up-to-date laboratory and pathologist especially experienced in the technique necessary to perform this work. Attention is also drawn to the provision of adequate means for treating syphilitic affections in such hospitals by modern methods and the need for closer coöperation between clinician and pathologist. After the painstaking manner in which it is obvious that Dr. Eager has carried out his duties, it must be with a sense of great satisfaction to himself and colleagues that he has received the honor of the Order of the British Empire from the King.

Galant, S. THE NEOLOGISMS OF PATIENTS SUFFERING FROM MENTAL DISEASE. [Archiv f. Psychol., 1919, Vol. LXI, p. 12.]

The author gives full examples of neologisms typical of the various mental diseases, together with discussions of their mechanism. As these phenomena can be best classified on the basis of dementia precox, he first gives examples from this group, dividing it into paranoid, catatonic, and hebephrenic types. Neologisms as entire systems constitute one of the important symptoms of the paranoid type. The author cites a case in which the stimulus word was "schizophrenia." The physician had told the patient that patient was suffering from schizophrenia. The reaction was an entire system in which this word was given a new meaning as "the culture of the third millennium, the coöperative soul confederation, etc." Paranoid cases in which the system of neologisms are so strictly carried out as in the author's are rare. The mechanism is revealed by the manner in which the association between thought is broken, as though

each group of associations is detached from other associations and runs its own course. If a thought emerges which has nothing to do with the system, there is a pause; when a thought in keeping with the complex arises, the associations run on again, as it were, of themselves. In the catatonic type the neologisms are not psychogenic—they are neologisms of the tongue, not of the brain. The neologisms of hebephrenics may be called the symbolic type, being really the words of ordinary speech symbolized. Epilepsy is the disease in which after dementia precox neologisms are most frequently observed, but here the mechanism of their formation is quite different. Epileptics forget words owing to amnesic disturbances and coin new ones to take their places; they also have a tendency to explain meanings by joining some quality to the main word, saying, for example, instead of merely "spring," "water-spring." Epileptics have an extreme fondness for rhymes, often speaking rhymes. Another peculiarity of this class is speaking in fables, personifying animals and things and attributing human qualities to them. Sometimes the fondness for symbols is as great as in dementia precox. Epileptics also frequently dissociate words and meanings. The neologisms of other mental diseases are not characteristic. Where new words are formed they are evidences of individual peculiarities and have nothing to do with the real picture of the disease. [J.]

Kretschmer, Ernst. THOUGHTS CONCERNING THE FUTURE DEVELOPMENT OF A PSYCHIATRIC SYSTEM. [Ztsch. f. d. ges. Neurol. u. Psychiat., Vol. XLVIII, p. 370.]

Körtke's point of view concerning a two-fold system, a psychic and somatic series, for the classification of mental diseases, is somewhat in the direction of the author's views in what he calls the "polydimensional diagnosis." However, the author does not see the advantage in carrying through a two-fold nomenclature, as, for example, for the psychological symptoms of dementia precox and for the serologicoanatomical "morbus." The effort should not be in the direction of separating the psychic and somatic correlates, but in the direction of establishing their points of connection. In epilepsy this is empirically possible; in dementia precox there is evidence of such relation; in the circular psychoses it is a postulate. The goal of research in psychiatry is to form a science of constitutions. In this way it will be possible eventually to distinguish definite sorts of constitutions—groups of hereditary tendencies with their variations and catastrophes which are now designated as depressions, katatonias, epileptic stupors, etc. Instead of disease pictures arrived at by mutual agreement in definition, there will be family and life pictures, and the diseases will be regarded as episodes in this larger frame. There will be one category in which the soul and its inner tendencies will be placed, and another in which the individual, as he is affected from without, will be considered. The series of constitutional traits forms the first group in psychiatric classification, that of individual character

traits the second. These two diagnostic systems do not exist side by side, but are superimposed one on the other without coinciding in their outlines. The effort should be made to avoid a mixed diagnosis and to make one of overlying strata, as it were. Thus the advances in the direction pointed out by Kraepelin would not be toward symptom complexes and disease unities, but toward the two-fold forms or the manifold forms of the same disease, leading not to artificial boundaries, but to the open field, where the glance can range over the complicated play of the separate forces that make up the mental life. [J.]

Sandy, William C. THE ASSOCIATION OF NEUROPSYCHIATRIC CONDITIONS WITH INFLUENZA IN THE EPIDEMIC OF 1918. [Am. Arch. Neur. and Psych., August, 1920.]

Influenza could be deemed a significant etiologic factor in only 73 out of over 70,000 neuropsychiatric cases reported to the section of neurology and psychiatry in the office of the Surgeon General. Thirty-two cases belonged to the infective-exhaustive-toxic group, nineteen were psychoneuroses, four manic-depressive psychoses, seven dementia precox, four neuritis, and seven miscellaneous. Delirious features were present and other symptoms indicative of severe general reaction in the infective-exhaustive-toxic types. The dementia precox patients had apparently been normal mentally until the attack of influenza. The manic-depressive cases presented no unusual features. The neurologic conditions associated with influenza were paralysis of the facial nerve, neuritis and cerebral embolism. [Stragnell.]

Phillips, N. R. GOITRE AND THE PSYCHOSES. [Journ. Mental Science, October, 1919.]

On visiting the wards of the Bel Air Asylum, near Geneva, Switzerland, this author was impressed by the high percentage of patients suffering from goitre—36 per cent for both sexes—and thereupon examined all patients in the St. Andrew's Hospital, Northampton, England, with the result that one patient in every eight showed some thyroid enlargement. As to the mechanism of this association he points out that (a) goitre is, at some time in the patient's history, accompanied by a condition of hypo- or hyper-thyroidism, and that (b) either of these conditions is capable of inducing a state of autointoxication with mental symptoms. His series of cases shows that the nature of the psychosis is determined, in some degree, by the form of the functional disturbance in the thyroid gland. For example, hyperthyroidism is usually associated with states of excitement and agitation, such as manic-depressive insanity; whereas hypothyroidism is more often associated with states of apathy and indifference, such as dementia precox. The treatment of the psychoses associated with goitre depends to some extent on the nature of the functional disturbance in the thyroid gland. If the signs point to hypothyroidism, treatment by thyroid extract should be instituted. If, on the

other hand, hyperthyroidism is present, treatment should be directed to the removal of the mental element, which is now admitted to be of great importance in the etiology of this condition. The only satisfactory way of accomplishing this is by the employment of psychotherapy.

Bolten, G. C. ANTITRYPSIN IN THE BLOOD FOR PSYCHIATRIC AND NEUROLOGICAL DIAGNOSIS. [Monatsschr. f. Psychiat. u. Neurol., 1918, Vol. XLIII, p. 215.]

The normal and pathological antitrypsin of the blood serum may be increased from various causes; for example, when certain cells and tissues are destroyed to any considerable extent, certain ferments pass into the circulation and the organism reacts against this invasion by the formation of defense ferments. Through this process of destruction of tissue large amounts of lipoid may be set free and find a way into the blood, there combining with the serum albumin and leading to an increase of the defense ferment, antitrypsin. It has long been known that in certain organic processes of the central nervous system as result of destruction of essential elements, particularly of the ganglion cells, lecithin passes into the blood, resulting in an increase of this defense ferment. The author undertook experiments to determine how far the presence of an organic cerebral pathological process could be determined from the condition of the antitrypsin content in the blood. He arrived at the conclusion that in the functional neuroses (hysteria, neurasthenia, affect epilepsy [Bratz], etc.) the antitrypsin titer is always normal; in the organic psychoses (organic epilepsy, all forms of dementia) and in progressive, organic disease of the central nervous system there is more or less increase of antitrypsin in the blood. For this reason the analysis of the blood, according to the author's method, is a very useful diagnostic aid in differentiating hysteria from dementia precox and from manic-depressive psychoses, etc. In organic (cerebral) epilepsy, as a rule, there is a very perceptible increase of the blood trypsin; immediately after a convulsion, however, the titer falls to nearly normal, after which it gradually rises again; so that a normal antitrypsin content is never found to remain normal for any length of time. In genuine epilepsy, as long as the dementia is not pronounced, there is no increase in the blood antitrypsin, neither in the interprobysmal stages nor before, after, and during the convulsions. If a secondary dementia has made its appearance this method no longer permits a differentiation between genuine epilepsy and cerebral epilepsy. [J.]

Ammann, Robert. BROMIDE POISONING AND WRITING. [Zeitsch. f. d. ges. Neurol. u. Psychiat., 1916, Vol. XXXIV, p. 13.]

The bromide salts play such an important part as a remedy in epileptic seizures that a knowledge of the signs of bromide poisoning is of the greatest importance for physicians. The author sums up an extensive study of the subject as follows: After a single dose of bromide there

was slight intoxication of short duration. The continued administration of bromide led first to a condition of saturation of the body with bromide, less being eliminated than was taken in. From this saturation toxic phenomena may make their appearance, slowly or more rapidly where large amounts of bromide are given with small amounts of sodium chlorid or where there is some idiosyncrasy in the patient. In rapid poisoning the following phases may be recognized: A short period of elation and ease of movement (paralysis of inhibition); a time of premonitory symptoms with beginning sleeplessness and indifference, disturbances of speech, especially of psychic speech factors. These initial disturbances grow rapidly worse—it may be over night—so that the extreme phase is reached suddenly. Speech and writing are disturbed to a great degree; both the movements and ideas in writing suffer and mistakes are no longer noticed. When the bromide is discontinued and sodium chlorid given the toxic phenomena do not cease immediately, but new disturbances make their appearance, as is usual when administration of stupefying poisons is interrupted. After some vacillation the mood changes to the opposite. Confusional conditions may set in, and though consciousness clears up rapidly, the disturbances of motion as well as those of the higher psychic faculties may persist. The circulation also reaches a high degree of disturbance. The former sleepiness cedes to insomnia. When the dosage of bromide is modified the toxic phenomena are reduced and cease within the course of a few weeks. Accompanying these psychic phenomena there are also physical signs: disturbances of circulation, inflammation of the mucous membrane, exaggeration, and later absence of reflexes proceeding from above downward, weakness and incoördination of muscular movement, including eye movements. Slow poisoning results when bromide has been given for a long time, but not in such quantities as to cause acute symptoms. In these cases there may be, beside the already mentioned signs, disturbances of digestion and loss of strength. Peculiar skin irritations are sometimes caused, due to idiosyncrasies of the individual. [J.]

Stern, H. POISONING BY BROMURAL. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLV, p. 374.]

In the literature attention had been repeatedly called to the resemblance of the disturbances of speech and writing in bromide intoxication to those in progressive paralysis. The author describes a case in which this resemblance was very obvious. The case is also remarkable from the proof it offers of the toxic effect of the bromide component of bromural, which has been denied by some writers. The physical symptoms corresponded to those described by Ammann as characteristic of bromide poisoning, and the case may be considered as positive evidence against the harmlessness of this preparation. The disease picture which the author's patient presented resembled that of general paralysis so closely that upon a first examination the observers were led to make the diag-

nosis of paralysis. They were misled by the very characteristic speech disturbances, though reaction to light and patellar reflexes were present. In the absence of the serological examination (which is an absolute requirement for a certain diagnosis of paralysis) the concurrence of the suspicious psychic picture and the one physical classical physical symptom (the speech disturbance) was not sufficient to warrant the assumption of paralysis. But when it is taken into consideration that in bromide poisoning the patellar reflex, after initial exaggeration, may be destroyed, it may readily be seen how careful the diagnostician must be in assuming general paralysis, and how necessary the Wassermann in blood and spinal fluid are, to corroborate the diagnosis. [J.]

Miller, R. S. PELLAGRA AND PELLAGRA PSYCHOSIS. [Lancet, Oct. 16, 1920.]

These authors had opportunity in Egypt to study 757 insane pellagrins. These cases were classified as acute confusion (amentia), 320; mania, acute, recurrent, febrile, 115; melancholia, simple and recurrent, 113; imbecility, 28; dementia, 103; adolescent insanity, 26; drug insanity, 26; epileptic insanity, 23; general paralysis of the insane, 2; returned not insane, 1. Thus 320 cases, or 42 per cent, fall directly under the heading of amentia, the typical psychosis of the earlier stages. The subsequent history of these patients was: Died, 240 (32 per cent); discharged, 359 (47 per cent); remaining, 158 (21 per cent).

Liebers, M. NONALCOHOLIC INSANITY OF JEALOUSY. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. LI, p. 103.]

Insanity of jealousy of nonalcoholic origin, as the sole pronounced and persistent symptom of mental disease, is held to be of very rare occurrence. It is recognized, however, that there may be a greater or less degree of jealousy as a constitutional character trait in individuals of neuropathic predisposition, and the author is of the opinion that cases are not infrequently met with where it is difficult to find the line of demarcation between these neuropathic tendencies and real insanity of jealousy. He describes a case of insanity of jealousy which originated and developed on a nonalcoholic basis from strong jealous character tendencies. It is noteworthy that the jealous insanity was very probably motivated by the unsatisfactory sexual life of the patient. That the case was a true insane complex was evidenced by the affective origin, the accompanying affective symptoms, the imperfect logical foundation, the incorrigibility, the falsifications of memories and perceptions, and the threatening attitude of the patient toward his wife. The anamnesis of the patient showed nothing more than a neuropathic diathesis with fainting spells, vertigo, psychogenic paralysis and headache—indications of the lability of the vasomotor system. While it was not impossible that the further development of the disease picture might lead to mental deterioration, yet the case is remarkable from the fact that for years

insanity of jealousy existed as an isolated and persistent symptom without hallucinations, delusions or schizophrenic signs. [J.]

Fell, Egbert W. PSYCHOSES ACCOMPANYING INFLUENZA. [Boston Medical and Surgical Journal, Jan. 29, 1920.]

The author thus summarizes his paper: A psychosis first noticed after influenza may have been preëxistent and not be influenced in its course by the infection. Influenza may alter the aspect and course of an existing psychosis by hastening it or adding new features. It may precipitate an impending psychosis, as paresis, or it may aggravate some organic condition and bring on the mental symptoms usual to that condition. Manic-depressive psychoses showed marked predisposition and a tendency to early recovery. The infective type of psychosis usually runs an even course and improves with the physical condition with a slight tendency to relapse. Cases, apparently deliria with precox features, or precox with deliria features, should be treated with considerable consideration prognostically, since recovery may occur when not expected, or vice versa. Dementia precox cases may begin as such, or with distinctly manic-depressive features, or with confusion and disorientation. They run a rather rapid course and quickly assume, as a rule, the hebephrenic picture. About one third of the cases are of this class.

Menninger, Karl A. INFLUENZA PSYCHOSES IN SUCCESSIVE EPIDEMICS. [Am. Archives Neurology and Psychiatry, January, 1920, Vol. III, pp. 57-60.]

Two cases are presented in which there is a history of the appearance of a psychosis following influenzal attacks in the epidemic of 1890-92 and the reappearance or reprecipitation of psychotic manifestations by attacks of influenza in the epidemic of 1918. A man of forty-nine was psychotic for a short time after influenza in his early twenties and then quasi-normal for a score of years. For a few years prior to the 1898 epidemic he had been regarded as queer, suspicious, subject to outbursts of anger, etc. Subsequent to influenza in October, 1918, he became grossly deluded, hallucinated, mute, silly, etc., and was committed with a diagnosis of hebephrenic schizophrenia. The second case was that of a woman of thirty-seven who, at ten years of age, had had influenza followed by mental symptoms which grew in severity until commitment was necessary. She escaped from the hospital after ten years' residence, and lived at large, apparently successfully. Influenza in January, 1919, was followed by an exacerbation of symptoms requiring commitment. Diagnosis, hebephrenic schizophrenia. A third case is given in which influenza was the active causative agent twenty-seven years ago, and unknown factors within recent months. The writer recalls Kraepelin's doctrine of specificity, and further makes the point that cases such as these "in which an infection (influenza) or some other incident is followed by a psychosis which improves, only to reappear under renewed

conditions of deleterious influence (here influenza again), suggest the chemical process of reversibility. * * * By extension of the hypothesis of the similar etiology of delirium and schizophrenia, and comparison with the phenomenon just noted, one can conceive that postfebrile deliria may represent, as the writer would propose, a form of reversible schizophrenia." [Author's abstract.]

de Kock, P. J., and Bonne, C. PELLAGRA IN SURINAM. [Nederl. Tijdschr. voor Geneeskunde, 1920, LXIV, Sept. 11, p. 965, (1 plate).]

The writers record several cases of pellagra admitted to an asylum, and give an excellent account of its psychosis. There appears to be no characteristic psychosis, and yet, although the clinical picture varied in many respects, there were many points of agreement in the various cases. A psychical depression always marked the early period, a complete dementia the terminal, and great variations the intervening period. According to the patients' relatives, the onset was very slow. The earliest symptoms were diminished interest in work and surroundings, slackness in work or neglect thereof; the patients became taciturn and solitary, and felt ill, but complained of nothing special. These symptoms slowly increased, and the patient became slovenly, nonchalant in manner, forgetful; they wandered, lost their way, and neglected themselves so that they had to be admitted. After this the clinical picture developed in several directions: in six cases apathy was the chief symptom; next appeared a slowly increasing dementia; by degrees they showed lack of attention, did not speak spontaneously, and answered questions seldom or not at all; generally artificial feeding was needed; they moved themselves slowly, and then only when necessary; frequently catatonia and stupor were present, so that they resembled the catatonic form of dementia precox. In other cases, after the depressed period other signs appeared; thus, a man gave the typical picture of the expansive form of paralytic dementia together with the characteristic cutaneous and abdominal signs of pellagra; another showed rather the demented form of G. P. I.; a young woman was maniacal for two months, and then became deeply depressed, with self-accusation, anxiety attacks, inclination to suicide, and refusal of food; a man had epileptic attacks, with typical epileptic dementia, and amongst his pellagric abdominal symptoms had severe gastric crises like those of tabes. The psychical symptoms of pellagra are but little characteristic, and when the cutaneous and abdominal signs have not yet appeared the picture mostly suggests catatonic dementia, and sometimes general paralysis or the manic-depressive psychosis. Nor are the nervous symptoms characteristic; those observed by the writers were neuralgic pains, facial, sciatic, or intercostal; often these pains were assimilated as illusions, and the patients interpreted them either as the operation of spirits or of animals crawling under the skin, which they attempted to get rid of by all sorts of violent means. Paresthesiæ were often met with. In the terminal period there were

usually sphincter affections and exaggerated tendon-jerks; two cases had irregular pupils not reacting to light. The prognosis depends greatly on the period of the disease in which they are seen. Severe gastrointestinal symptoms are of bad omen. But in the early period an appropriate regimen has a great chance of succeeding. In the cases which show only slight neuralgiæ, paresthesiæ, or vague neurasthenic symptoms, or slight melancholic depression, one should look for evidence of the characteristic cutaneous signs of pellagra. As to the rôle of insects in pellagra, the *Simulium* is not found in the coast region from which the writers' patients came, whereas the *Stomoxys calcitrans* and the *Ceratopogoninæ* are found everywhere. [Leonard J. Kidd, London, England.]

Forrester, A. T. W. MALARIA AND INSANITY. [Lancet, February, 1920.]

Dealing with the association of mental disease and malaria, let it be said at once that there is no single train of mental symptoms which can be isolated as specific and labelled "Malaria." It appears to me that no new train of such symptoms is set up, and that in comparison with any other acute specific fever malaria differs only in intensity, and in a more selective action of its toxin on nerve tissue. The brunt of the attack falling on the cortical higher centers, we may get the syndrome of acute confusion of a cerebral type—the type of mental disorder which occurs very, if not most, commonly. To show a finer differentiation in its choice of nerve cell, I have seen four cases of single nerve paralysis due to malaria. Two of these involved the subtrapezial plexus alone, others the third and seventh cranial nerves.

Both on the physical and mental sides the cases best divide themselves into two groups: (1) Those associated with the actual malarial attack itself; (2) those occurring as a result of repeated attacks. The former are always the more acute and more approximating to a severe delirium. Other things being equal, the prognosis is always better, and as a rule they yield easily and rapidly to appropriate treatment.

(1) *Mental Symptoms in Association with an Actual Attack of Malaria.*—In this group almost any of the recognized types of psychosis can be set up, but one symptom stands out very prominently amongst the rest—namely, mental confusion. This to a slight degree is often noticed in the ordinary malarial wards, and some of it must undoubtedly be attributed to the accompanying pyrexia. It is often given by those sufferers who attempted to carry on during repeated relapses, some of them admitting that at times they scarcely knew what they were doing.

The degree of confusion may vary from what may be described as a severe delirium, such as occurs in any pyrexia, to a complete dissociation of personality, the latter giving beautiful and typical examples of the occurrence of a definite fugue. Dealing with military cases, nearly always some breach of discipline had been committed, the commonest being "absent without leave." In every case there was complete amnesia

for the whole period, the shortest of which was a few hours and the longest three months. This serious complication occurred so often, as compared with its incidence apart from malaria, that it seems as if this disease must be reckoned as an actual determining cause.

Cerebral Malaria.—Diagnosis here rests on obtaining a positive blood film. I have seen this very dangerous condition give a picture of cerebral hemorrhage, of just drowsiness or simple delirium, of extreme excitement and violence, or of epileptiform attacks. It is a condition to be especially on the lookout for during the autumn months, and it demands immediate and energetic quinine treatment by the intravenous method.

2. *Mental Symptoms as the Result of Repeated Attacks.*—It is again found that any type of psychosis can be set up, but the prominent symptom is still confusion. Almost equally important is another group of cases exhibiting mental depression, the result of prolonged stress and toxemia. Heredity, too, in this group, comes into the question prominently as a factor.

Now, where it is a case of chronic malarial poisoning there is always involvement not only of the cells of the higher centers, but the whole central nervous system shares in the attack. The sympathetic and vagus are affected, giving rise to abnormalities of pulse, tachycardia, palpitation, shortness of breath on exertion. There are frequently cardiac murmurs present, and marked coldness or even cyanosis of fingers and toes. Superficial and deep reflexes are always altered and generally markedly exaggerated. Knee and ankle clonus occur, and I have seen nystagmoid movements of the eyes. There is always a marked anemia and debility, sometimes a profound cachexia. Spleen and liver are enlarged, and there is, of course, wasting and emaciation.

Prognosis and Treatment.—Unless other causes are at work, the prognosis is always good and is concomitant with improvement in health. Unfortunately, the malarial parasite, especially the benign tertian variety, is extremely resistant even to prolonged and energetic quinine therapy. But as soon as this was instituted, despite the tendency to relapse about the tenth day, patients at once began to mend. With cachetic conditions large doses of quinine are not readily tolerated by the stomach, and by upsetting digestion mitigate against the equally important assimilation of food. Intramuscular administration is of undoubted benefit under these conditions, and I have seen rapid improvement follow this when combined with intravenous galy. Cacodylate of soda proved disappointing in my hands. And even though one was also frequently disappointed by the reappearance of malarial attacks soon after a course of intramuscular quinine injection, yet these patients always gained considerably in weight and improved in condition. On these grounds alone the course was justified, and in competent hands the method is practically free from risk of complications. The importance of correct and appropriate treatment is a point that is brought out most prominently. It was quite common to

be given a history of frequent relapses treated casually with occasional doses of quinine, and no attempt made to control the attacks. Although it is true that the mortality from this disease is extremely low, it must be borne in mind that a potent and powerful poison is circulating all the time, which may flare up at any moment into an acute condition such as cerebral malaria, or result in permanent damage to mind and body. All cases of malarial psychosis should be removed as soon as possible from danger of reinfection.

Prophylaxis.—With regard to malaria itself, maintain body resistance as far as possible by good feeding and ordinary hygiene.

If every case were systematically and thoroughly treated it would undoubtedly go a long way to the prevention of mental complications arising in those already affected with the disease. If a watch is kept for incipient signs, and they are recognized as such, by appropriate treatment these cases can often be saved from proceeding to a well-defined psychosis; by this means being saved from the undoubted stigma which the word "mental" carries. [Author's abstract.]

Hitzenberger, Karl. PSYCHOSES AFTER GRIPPE. [Monatschr. f. Psychiat. u. Neurol., November, 1919, No. 5, Vol. XLVI.]

During the epidemic of 1918, in Vienna, the author observed fifty-five cases of mental disease as result of grippe. He divides these cases into two groups, namely, those in which the mental disturbances were directly due to the grippe, and those where the infection acted only as an agent setting a latent disease in activity. The author places in the first group the fever deliria and the postfebrile amentias; in the second those disturbances which he designates pseudoinfluenza psychoses. The fever deliria were nearly always characterized by the same symptoms; the patients do not recognize their surroundings, they are excited, fear poison, robbers, etc., and have various delusions springing from fear. The prognosis of this form *quad vitam* is unfavorable, the high mortality being evidence of the severity of the infection of which the psychosis is the consequence. In the postmortems, hyperemia and edema of the brain and of the leptomeninges were discovered. The invariability of the symptom complex, together with the absence of hereditary stigmata, goes to show that the individual factor plays no part in this type of psychosis from grippe, and that those who are wholly normal may be mentally affected by the virus. The mental disturbances of the second and larger group usually make their appearance after the grippe has run its course. The symptoms are disturbance of association, disorientation, confusion, hallucinations, manic or depressive conditions. Prognosis seems to be generally favorable as to recovery from amentia after grippe. The virus of the disease is one factor causing mental disease after grippe; exhaustion and predisposition are other factors. But these are not the sole causes. for nearly one third of the inhabitants of Vienna were victims of

grippe during the epidemic, yet only fifty-five individuals developed mental symptoms needing treatment in an institution. There would have been a much higher percentage if the mental disease were due to these three factors. There must, therefore, in the author's opinion, be another determining cause as yet unknown which was of a nature to affect only fifty-five individuals among so many thousands. [J.]

Preti, L. MORBID STATES SUBSEQUENT TO TYPHOID VACCINATION. [Atti. Soc. Lomb. Sc. Med. e Biol. Milano, 1919, VIII, 85.]

Clinical illustrations of two cases in which morbid nervous symptoms made their appearance after the antityphoid vaccination. In the first one total blindness appeared about twenty-four hours after the first injection of antityphoid vaccine. This persisted, together with fever, for about ten days, after which the temperature became normal and other subjective phenomena disappeared, leaving only a remarkable diminution of sight. Six months afterwards a careful examination of the eyes showed a very pale papilla with atrophic blood vessels and *vijus* reduced to one eighth. The author thinks that the initial affection must have been an inflammatory process of the optic nerve.

In the second case, ten days after the second injection of antityphoid and antiparatyphoid vaccine left brachiofacial chronic convulsions made their first appearance. These were of a frequent and constant type and were accompanied by a slight paresis of the affected parts. There was no recovery, and one year afterwards these attacks of brachiofacial Jacksonian epilepsy were still frequent, and the left arm showed a certain degree of motor weakness. The author is inclined to think that the vaccination may have in this case provoked an irritative condition or perhaps a localized process on encephalitis of the cerebral cortex of the right inferior Rolandic zone.

In both cases no other cause of these troubles of the central nervous system could be found but the antityphoid vaccination. [Da Fano.]

Gordon, Alfred. MENTAL DISORDERS FOLLOWING INFLUENZA. [Phil. Neur. Soc., February, 1920.]

That the function of the brain may be disturbed by bacterial poisons is too obvious to dwell upon. The organism always endeavors to get rid of exogenous, endogenous, and bacterial poisons either through the kidneys, lungs, salivary and cutaneous glands. Amelioration of mental disorders not infrequently run parallel with the proper functioning of defense organs.

The author refers in his contribution to an infectious process which, after the acute phase had subsided, produced very profound disturbances in the higher functions of the cerebrum. His study is based on a series of sixty-two cases, all seen at the end of the febrile period during the phase of asthenia which ordinarily follows infectious diseases. The mental manifestations were particularly marked in individuals whose

previous medical histories either suggested neuropathic phenomena or contained accounts of psychotic disorders. This group differed greatly from the groups of cases without previous mental disorders. Besides these two groups in which the confusional element predominated there was another small series of cases in which the most conspicuous symptom was amnesia of a pronounced character. The latter was but one of the manifestations of a general cerebral condition caused by a postinfectious toxic state. The author found, therefore, three varieties of mental states: (1) A profound confusional psychosis with delusions and hallucinations; (2) a mild confusional state without hallucinations, but with illusional conceptions; (3) cerebral asthenia with conspicuous amnesic phenomena.

The author also observed in his cases a relationship between the various manifestations in the mental sphere and the physical condition. Improvement of the latter is followed by an improvement of the former. [Author's abstract.]

Weston, P. G. ANALYSES OF BLOOD OF INSANE PATIENTS. [Am. Arch. Neur. and Psych., III, 147, February, 1920.]

The author made chemical analyses of ten typical cases of manic-depressive, dementia precox, and epileptic psychoses and tabulated the results. The ages of the patients ranged from eighteen to forty-four years. Total N, nonprotein N, urea N, creatinin, creatin, glucose, chlorin and calcium were determined. The values found for the various constituents were within the normal range. The statement of Ishida and others that there is a deficiency of chlorin in the blood of dementia precox patients was not confirmed. [Author's abstract.]

Riese, Walther. PSYCHIC DISTURBANCES AFTER SPANISH GRIPPE. [Neurol. Centralbl., November 1, 1918, No. 21, Vol. XXXVII.]

There is as yet no unanimity of opinion concerning the etiology of the so-called Spanish grippe recently epidemic in Europe. However, symptomatological similarity of this acute infectious disease to influenza is so striking and convincing that there seems full justification in regarding the "Spanish fever" as allied to the form of influenza which was last epidemic in the civilized world twenty-nine years ago. The picture which psychiatry has gained from observation of the disturbances following influenza is somewhat as follows: Influenza has a greater tendency than any other infectious disease to attack the peripheral central nervous system. On the ground of this affinity of the influenza virus to the nervous system there is an inclination to speak of a nervous form of influenza. Aside from the neurotic and other peripheral nervous phenomena resulting from the infectious disease, there are psychic disturbances which, according to the time of their appearance, their duration, and their probable etiology, are designated as initial, prodromal, fever delirium, fever psychosis, defervescence deliria, and finally the real convalescence psychosis. A few more men than women develop psychic

symptoms. Middle age is more menaced than any other period of life. The importance of the predisposition for the development of mental symptoms in connection with influenza is recognized on every hand, especially since Kraepelin showed that influenza alone would scarcely be sufficient to produce mental disease in an individual of normal constitution. For the production of a psychosis, some of the following additional factors are necessary: predisposition, or some other congenital or acquired disability; or fever and febrile disturbance of metabolism; or the development of the "grippe toxin" in the brain, the place of origination of the psychic disturbance. In this connection, the question whether the influenza has any influence on an existing psychosis has attracted attention, and if so, in what direction. It has been held by some writers that the superposition of influenza on mental disease has led to death; by others, that the acute infection has a favorable influence on a chronic infection. The communication of Metz that a case of paranoia was cured by influenza must be accepted with extreme caution, and the "cure" can certainly not be set down to the effect of the influenza. There are still other writers who have not noticed any effects on a preceding psychosis. No parallelism between the severity of the infection and the resulting psychic disease is supposed to exist. The clinical picture of mental disturbances after influenza is extremely variable. Those who have studied the disease do not maintain that there is a special influenza psychosis with a sharply defined symptomatological stamp, definite course and termination such as go to make up an independent psychosis. In the foreground of the influenza psychosis of the fever-free convalescent stage is the depression picture with hypochondriac coloring and also that delusional misinterpretation of the events of the environment which belongs to the depressive insanity of Kraepelin. An attempt is made to account for the depressive reaction by ascribing it to the general exhaustion of the organism. Besides these depressive stages, there are conditions of acute confusion with abundant hallucinations of sense. Pfeiffer's discovery of the exciting agent of influenza, though it may lead to a better understanding of the etiology of the fundamental disease, has not thrown any light on the nature of the subsequent psychosis. Differentiations from clinical similarity of the symptom pictures may be made, however, and thus certain syndromes may be diagnosed as epileptiform, delirious, stuporous, hallucinatory, and the syndrome following the amentia picture. The writer describes five cases. In Case 1, the psychosis was epileptiform. In Case 2, it was hallucinatory. Case 3, of which the picture was that of amentia, the author discusses somewhat at length. In the question of amentia, the difference between the idea of influenza and infectious psychoses of the present time stands in strongest contrast to earlier conceptions. The picture of amentia was formerly stupor, disturbance of thought in the sense of incoherence, hallucinations of sense, loss of judgment, emotional lability, namely, the hallucinatory confusion and alienation of earlier writers.

This conception of amentia was found too extreme, and in the descriptions of cases which followed influenza are many cases which must to-day be classed as a dementia precox or manic-depressive forms of insanity. The writer thinks it is perhaps going too far not to recognize amentia at all, but he agrees with the majority of writers in the view that the diagnosis of amentia as an independent form should only be made when the mental disturbance is directly caused by an exogenous agent, the microbe of the infection being such an agent. Cases 4 and 5 illustrate the difficulty at times of differentiating between amentia after influenza and dementia precox. Finally, the author mentions a case where, in connection with the Spanish fever, the symptom picture and clinical course was that of a true endogenous psychosis, namely, of melancholia. That hebephrenic and paranoid processes may develop for the first time under the influence of influenza is a fact so apparent that it scarcely needs emphasis. [J.]

Gleuns, J. W. PHOSPHATURIA AND PSYCHOSIS. [Psychiat. en Neurolog. Bladen, 1920, Nos. 3-4, May-August, p. 221.]

In a short provisional note presented to the Netherlands Society for Psychiatry and Neurology, Gleuns refers to the very common occurrence of phosphaturia in depressed states. In a case where he expected to find a marked phosphaturia he found none; he had reason to fear an on-coming dementia precox, and after a few months it did develop. Since that time he has often seen absence of phosphaturia in cases of depression that proved to be cases of dementia precox. He points out that the presence of phosphaturia does not exclude that disease; and he enunciates this dictum: "In the depressed states of early life, in which one thinks of the possibility of a dementia precox, the absence of phosphaturia is in favor of that disease." [Leonard J. Kidd, London, England.]

Kooy, F. H. BLOOD-SUGAR AND PSYCHOSES. [Psychiat. en Neurolog. Bladen, 1920, Nos. 3-4, May-August, p. 143.]

The sugar content of the blood was examined by Bang's method in a large number of cases of various psychoses. Examinations were made both in the fasting state and also $\frac{3}{4}$, $1\frac{1}{2}$, $2\frac{1}{4}$, and 3 hours after a breakfast of 100 gr. of bread and 200 c.c. of milk. The normal blood sugar content was found to be 0.98 per cent, 1.14 per cent, 1.16 per cent, 1.04 per cent, and 1.02 per cent. In the hebephrenic form of dementia precox there was a very slight increase. In typical cases of dementia paralytica there was also an increase; it was especially great after fits of passion or after paralytic attacks. In epilepsy it was diminished, but here also the influence of emotion in increasing the blood sugar content was evident. In melancholia there was often during the fasting state an increase, and an alimentary hyperglycemia was constant; the increase of blood sugar was greatest in the anxious and the very emotional forms of this disease. In mania there is frequently an increase, which is specially great in emotional states with pronounced exaltation, irritability, anger,

and destructiveness; in the slighter forms of mania the increase is much less, and in hypomania there was no increase of blood sugar. Kooy thus finds that in man is an increase of blood sugar in emotions, such as anxiety, fright, and passion; this expresses itself as an alimentary hyperglycemia, which is constant in melancholia, and specially in the anxious form. Kooy argues that the raised blood pressure, the hyperglycemia, and the obstipation met with in cases of anxious melancholia represent a reaction of the sympathetic nervous system; emotions of various kinds lead to increased secretion of adrenalin, and an excess of adrenalin in the blood. [Leonard J. Kidd, London, England.]

Moses, D. St. J. MELANCHOLIC STUPOR (PSYCHOCOMA). [Indian Med. Gazette, August, 1920.]

Moses reports the case of a man, aged forty-two, whose state of melancholia became psychocoma. For two and three-quarter years, the patient lay in a state of utter stupor, without manifesting any change that was perceptible. During the whole of the time he lay on the flat of his back, in practically the same position, with his forearms flexed at the elbows, his hands flexed at the wrists and meeting over the sternum, and his legs drawn up in semiflexion. All his limbs were as rigid as could be, and he resisted all efforts made, with any reasonable degree of force, to extend them. The muscles of the back and neck shared in this extraordinary stiffness, so that if he were lifted by the occiput the entire head, neck, and body could be raised as if he were a block of wood. His eyes in wakefulness were always wide open, and had a fixed, vacant, far-away stare, and the veins on his forehead stood out with a certain degree of prominence. There was an utter loss of volitional power. He passed urine and excreta in bed, and seemed to feel no annoyance or discomfort owing to this circumstance. His expression remained exactly the same throughout—utterly vacant. Words addressed to or shouted at him made not the slightest difference in his expression. On no occasion was he known to call for food or to manifest any desire for it, and never was he seen or known to help himself to any when food was placed beside him. Feeding was carried out throughout his illness by means of the nasal tube. Occasional attacks of diarrhea were the only other untoward incidents in the course of the case. His circulation remained moderately good throughout, and the reflexes remained normal. At no time were there any trophic changes, the patient keeping marvelously well nourished and entirely free from bed-sores or any approach to these—a circumstance which suddenly appears to be characteristic of cases of psychocoma. The patient suddenly awoke as if from a long dream. For the first time after nearly three years of the most rigid silence he spoke in a feeble whisper and indicated his desire to write. He was given pencil and paper, and instantly, in a perfectly legible though somewhat shaky handwriting, he wrote in English a few lines which had a perfectly rational meaning. Two days thereafter his voice was distinctly

audible and his speech quite intelligible. He was able to sit up with help and to take semisolid food, but appeared to be somewhat depressed. Before the week was out he was able to feed himself, and gradually attained to full vegetarian diet. He had only a very vague recollection of what had happened during the past three years. Massage and practice have restored his power of walking.

Benon, R. CLINICAL STUDY OF THE ALTERNATION OF EXCITEMENT AND DEPRESSION. [*Revue Neurologique*, January, 1920.]

Clinically agitation is divided into five classes: the maniac or hypersthenic; excitation motivated by joy; agitation on a basis of anxiety; agitation on a basis of enervation; and confused agitation. The alternations of excitement and depression in the constitutional dysthymics are produced by external causes, while in the periodic dysthymics the alternations appear suddenly and without exterior determinants. [Camp.]

Heidema, S. T. BLOOD SUGAR IN PSYCHIATRIC AND NEUROLOGICAL PATIENTS. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLVIII, p. 111.]

The author, following the method of Ivar Bangs, undertook experiments to determine the quantity of blood sugar in a series of patients with various disease pictures. Summing up the results, he states that in the majority of cases of melancholia, mania, dementia precox, Basedow's disease, alcoholism, dementia paralytica, traumatic neuroses, and in cases of brain tumor, meningitis serosa, syringomyelia, hemorrhagia cerebri, and chorea hereditaria, there are hyperglycemia. These findings corresponded in general with those of other writers on the subject, though in dementia precox the author's cases of excess of sugar in the blood (over half of the patients examined) was higher than the percentages given by Schultze and Knauer (41 per cent). Like these writers, he found the percentage much lower for hebephrenics than for catatonics. The author's results in epilepsy also deviated from those of others, his percentages being higher. The author asserts that in psychiatric and neurological patients where glycosuria makes its appearance it is connected with the hyperglycemia and is probably a result of the same. The quantity of sugar in the blood preserves a sort of equilibrium between the intake of carbohydrate and elimination of the same in decomposition products, that is to say, between the storing of glycogen in liver and muscle and the dissimulation. It is clear from the various factors entering into these processes that the same explanation for the hyperglycemia will not serve for all diseases, and from their complexity that perfect explanations cannot be expected. It is known that stimulation of a certain place in the fourth ventricle produces glycosuria and hyperglycemia, perhaps by way of the sympatheticus. It may therefore be expected that various processes at the same place, brain tumors, etc., would bring about the same result, thus accounting for the excess of blood sugar in diseases due to local changes. The hyperglycemia in

dementia paralytica and juvenile paralysis may be connected with the ependymitis granulosa in the fourth ventricle. In Basedow's disease, of which the etiological moment is a hyperfunctioning of the thyroids and suprarenals, it may be due to disturbances of the inner secretions; in alcoholism, to the general intoxication. The high frequency of hyperglycemia in dementia precox is ascribed by some writers to a hypo-functioning of the thyroids, by others to a hyperfunctioning of the same. The author considers his cases as evidence in favor of the latter view. It is in the manic-depressive group that hyperglycemia is most often found, and the author is of the opinion that the disturbance is just as marked in the mania as in the melancholia. The objections to two more or less prevalent theories, namely, that it is due to retarded metabolism (Raimann), or to the depressive affect, are discussed, and the author adds that it seems possible to explain hyperglycemia in psychiatric patients, at least in part, as due to an increased activity, it being an ascertained fact that moderate muscular activity increases the content of sugar in the blood. This theory would be more comprehensible than either Raimann's or Laudenheimer's, for the excess of blood sugar could then be regarded as due to a self-regulation of the organism, *i.e.*, as a storing of that material in the blood, at the expense of which the increased work must take place. In many patients suffering from melancholia there is great increase of muscular activity. This view would not explain glycosuria in passive stuporous patients, but in patients in catatonic stupor the muscle tension might have the same significance as muscular activity. [J.]

Duprat, G. L. EXPANSION AND DEPRESSION. [Journal de Psychologie, 1920, April 15, Vol. XVII, p. 332.]

Emotions never appear as single phenomena, and the school of Freud has made an advance in studying them as "complexes," ideo-affective syntheses, of more or less latent evolution capable of dominating the entire subconscious life. Observation, even nonscientific, has long led to the conviction that certain emotional dispositions are the conditions of existence of certain others. The author sums up the results of two hundred observations of normal and psychopathic individuals and finds at the foundation of character either expansion or depression, revealed by the nature of psychic selections—associations, evocations, response to suggestions, spontaneous polarizations, and by pneumo-, sphygmo-, and ergographic results. The author finds the designation "excited temperament" as opposed to depressed, illogical, because depressed individuals are often excited; depression is rather opposed to expansion. Upon these two temperaments the same events of life produce totally different responses, causes of pleasure and joy are therefore not external, but depend on the psychophysiological makeup. The depressed character under the influence of fear is always expecting "the worst"; the fears of these depressed individuals are monotonous, without intellectual or

practical reaction—tending toward melancholy stupor. The expansive character under the same influence augments prudence or reacts quickly against sudden danger. In love and ambition a similar contrast is apparent. There is no pleasure, no sorrow, no agreeable or painful state which cannot be explained by the affective foundation of the personality. Expansive characters only are capable of attaining to the highest degrees of human evolution in social, esthetic, moral, or intellectual directions. The depressed tend toward egotism, vulgar cupidity, superstitions, hypocrisy, jealousy, vindictive hate, etc. In these classifications the author sees an objective foundation for differentiating character, and if these lines are followed he believes that ethology, a science the value of which was emphasized more than half a century ago by John Stuart Mill, may become a branch of experimental psychology. [J.]

Ewald, Gottfried. PARANOIA AND MANIC-DEPRESSIVE INSANITY. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLIX, p. 270.]

There is still no unanimity of opinion in regard to the nature of paranoia. Some writers have sought to identify the group thus designated by Kraepelin with the manic-depressive group (Specht); others with the schizophrenic, as a lighter form which does not lead to deterioration. The author cites two cases in which the acute onset of the persecutory ideas and their disappearance in a few months presented marked differences from the course Kraepelin ascribes to true paranoia, and rendered the differentiation from circular insanity difficult. The author arrives at the conclusion that under paranoia Kraepelin has really described two different disease pictures which should not be classified together—on the one hand, persecutory insanity or insanity of jealousy (which the author would assign to the manic-depressive group); on the other, disturbances resembling dementia precox. In both cases described by the author there was an inherited tendency to distrust. In the second case this tendency made the patient serious and overconscientious, with relapses into drinking, sport, and gay companionship. Upon the basis of this distrustful and hypomanic temperament was constructed a persecutory insanity with partial insight. The author is of the opinion that such paranoid forms constitute a special subdivision of the manic-depressive group. The author outlines a classification of degenerative insanities (to which he considers his two cases to belong), including both endogenous and reactive forms, suggesting for these types the designation *hyponoia*, because of the affect at the root of the disease, *i.e.*, the distrust or suspicion (*υπόνοια* meaning suspicion in contradistinction to *παράνοια*). By *hyponoia* he understands an autochthonous psychosis of suspicion or distrust to be placed in parallel with mania and melancholia and separated from paranoia, representing a subgroup of autochthonous disturbances due to affective lability, in which, founded on the indigenous distrust, as a specific tendency a logically constructed insane system is built up. This construction takes place after the man-

ner of the systems built on hyperquantivalent ideas, sometimes with periodic remissions and partial insight, sometimes proceeding continuously and insidiously to systematic perfection; but always without any apparent mental defects that interfere with thought, volition or action. It may be difficult in a given case to determine whether the disturbance shall be regarded as hyponoia or circular insanity. But this is not the main point, in the opinion of the author. The essential point is that the greater part of those diseases which have been regarded by Kraepelin as paranoia belong to "hyponoia," arising from a labile affective foundation. [J.]

Hesnard. PSYCHICAL DISTURBANCES OF ACUTE ENCEPHALITIS. [*L'En-céphale*, 1920, July 10, Vol. XV, p. 443.]

The author states that up to the present time psychiatrists have given little study to the psychic forms under which encephalitis makes its appearance—a grave mistake, for when an acute infectious disease assumes a psychic form, the fundamental disease may be lost sight of if the various types are not understood. The author reviews the observations of other writers concerning the mental disturbances in meningitis as well as his own, and emphasizes the necessity of distinguishing between two sorts of clinical facts in order to gain a clear idea of the subjects, namely, the psychic symptoms accompanying acute epidemic encephalitis, either the classical type or others (neuritic, tetanic, myoclonic, etc.), on the one hand, and the acute epidemic psychoencephalitis, on the other. The psychic symptoms accompanying the ordinary forms of encephalitis are quite constant and follow immediately after the somnolence and ocular paralysis, consisting in a more or less grave disturbance of the mental processes, mistakes in appreciation of reality, disorientation, inaccuracies of perception or reason, or confusion of reality and imagination—symptoms usually met with in intoxication or exhaustion. The psychic forms which acute epidemic encephalitis assumes, however, are either pure, characterizing the entire evolution of the disease, or they alternate with the ordinary type of the disease. For example, a stuporous or delirious period succeeds the somnolent, ophthalmoplegic phase, or a delirium may precede the prolonged hypersomnia (a term which the author prefers to "lethargic"). These psychic forms supervene in individuals who are in a condition of extreme exhaustion, and they do not appear to have a distinct etiology. In encephalitis, as in all other infections, the constitutional terrain is revealed in secondary evolutionary complications of the psychic syndrome. The following psychic forms of encephalitis are noted: (1) The psychosomnolent form, where on the basis of hypersomnia, at some period of the disease, a more or less obvious psychic disturbance develops—hypomanic excitement, often complicated with onirism and confusion. In some cases the symptoms may resemble those of dementia and the patient presents the appearance of a general paralytic. In other cases the

delirium only makes its appearance tardily, and the psychosis may suddenly and unexpectedly assume a very grave aspect. (2) The form of lucid catatonic stupor, where various psychic disturbances are connected with a pseudo-Parkinsonian condition. The patient gradually becomes rigid from head to foot, assuming a passive air, the eye vacant and wide open, or sometimes the eyes may be closed. The same attitude is not always assumed, and it is not always an uncomfortable one, but the patient becomes, as it were, fixed in the position in which he happens to be, as though his general muscular activity were suspended, so that the question arises whether the disturbance may not, in some cases, be purely muscular. (3) The acute delirious form, where there is agitated delirium with hallucinations, incoherence, pseudodemented symptoms, motor excitement, stereotypies, tremors, exaggeration or inequality of reflexes, frequent pulse. The clinical picture may attain resemblance to delirious collapse, but meningeal reactions are rare. (4) The confusional forms, properly so-called, resembling the classical picture of infectious confusional psychoses. (5) Korsakow's form, only encountered in prolonged diffuse epidemic encephalitis. There is still little known concerning the psychopathic sequellae of psychoencephalitis, but besides those of the Korsakow type various others have been mentioned, especially in children—sluggishness of memory, difficulties in learning, emotional disturbances, transformation of character, etc. The author observed the development of systematized delusions in one case. Prodromal disturbances have also been observed, which in certain cases, for a considerable period, resembled the syndrome of dementia precox. In regard to the etiology of the disease the author questions whether it may not be due to a distance intoxication of the cerebral cortex, the source of which is localized in other nervous regions (the mesencephalon, for example); or, if the hypothesis of a septicemia be excluded, to a diffuse impregnation of the encephalon by free toxins in the course of a nervous affection without definite localization. [J.]

Wigert, Viktor. STUDIES OF THE SUGAR CONTENT IN THE BLOOD IN DEPRESSIVE PSYCHOSES [Zeitsch. f. d. ges. Neur. u. Psych., 1919, Vol. XLIV, p. 179.]

In fifteen cases with depressive psychoses all but three cases showed wholly normal conditions of the blood. In one of these three cases the hyperglycemia might have been due to menstruation. In the two other cases there was a more constant hyperglycemia, but as these results were in contrast with first twelve it could not be assumed without further evidence that the phenomenon was due to the emotional factor, especially as one was a case of progressive paralysis, a disease in which glycosuria is by no means unusual, and as the other case (a man of fifty-eight years) was possibly one of true diabetes mellitus. The question arises why hyperglycemia was absent in all these cases where, from the known influence of the emotions on the suprarenals, it might have been expected.

Treatment with opium could not be regarded as having reduced the blood sugar content because in eight cases there had been no opium treatment and these also showed normal sugar values. It might perhaps be suggested in explanation that in these protracted emotional states the hyperglycemia is only a transient phenomenon in response to a temporarily heightened secretion of adrenalin. Yet no such fact was revealed by repeated blood tests made at the beginning phases of pronounced emotional crises. Another supposition, adrenalin immunity after a certain period of activity, is contradicted by the fact that in three cases normal reactions of blood sugar were obtained after suprarenalin injections. It might be possible that the suprarenals after a time cease to respond to nervous impulses with increased adrenalin secretion, or that the nervous reaction to emotions which have lasted days and weeks may be dulled to such an extent that the hyperglycemia does not result. In these cases of depressive psychoses there was observed a pronounced alimentary hyperglycemia when the amount of blood sugar was compared with that found in normal individuals, but the author thinks that this discrepancy might have been due to causes other than the emotional factor (age of the patients, etc.). [J.]

Laignel-Lavastine and Logre. HEBEPHRENIC CATATONIA, AND ENCEPHALITIS LETHARGICA. [*L'Encéphale*, 1920, July 10, Vol. XV, p. 473.]

When the patient, a young man of twenty-five years, came under the author's observation, he presented all the signs of intense and prolonged catalepsy, with negativism, refusal of food, stereotypies of attitude and language, indefinite repetitions (12, 15, 20 times) of words or phrases; emotional indifference, with some purposeless aggressive reactions and ideas of persecution. The diagnosis of catatonic hebephrenia was made. In the hospital from which he was transferred he had been treated for three weeks under Widal for encephalitis lethargica, who founded his diagnosis on the psychic- and psycho-motor syndrome, somnolent aspect and catalepsy, incoherent delirium, and on the organic signs showing irritation of nerves and envelopes, lymphocytosis and albuminosis, abolition of tendon reflexes, fan sign on the left—all transitory symptoms which receded in a short time, together with the tendency to somnolence. The author emphasizes the importance of the case from a psychiatric point of view, giving rise, as it does, to questions concerning the relations between the psychic syndrome of encephalitis and that of hebephrenia. Was the hebephrenia, of which the patient presented a well-characterized picture, a consequence, a prolongation, or a sequella of the infectious process of the lethargic encephalitis? The history of the patient threw some light on the subject, for it was found that he had previously received hospital treatment for psychic disturbances. The case, therefore, illustrates the difficulty of distinguishing the symptoms due to encephalitis and those due to hebephrenia when the one disease is superimposed on the other, and the author concludes that there is such

a close resemblance in the symptom complex of the two diseases that it is very difficult to prove a diagnosis of lethargic encephalitis from the mental signs when this latter disease supervenes in hebephrenia. This difficulty of diagnosis does not arise from the vague and general fact that both affections present psychic symptoms, but to the very close resemblance of the separate symptoms in the two diseases (somnolent aspect, stupor, catalepsy, opposition, stereotypies, incoherent and aggressive impulsiveness.) [J.]

Lowrey, L. G. EFFECT UPON BLOOD PRESSURE OF ADRENALIN INJECTIONS IN DEMENTIA PRECOX. [Boston Medical and Surgical Journal, August 12, 1920.]

An analysis of the blood pressure reactions to the injection of adrenalin in seventy-eight psychopathic patients is taken as evidence that such an injection does not have the differential diagnostic value which has been claimed for it, at least in early cases. In fifty-four out of sixty cases of dementia precox there was an increase in blood pressure, forty of these showing a rise of more than five mm. Hg. In eighteen cases of other types taken for comparison there was a depressor reaction in four.

Antheaume, A., and Trepsat, L. GENERAL PARALYSIS AND CATATONIA. [L'Encéphale, 1920, May, Vol. XV, p. 297.]

The authors describe a case of general paralysis in process of evolution in which motor disturbance was one of the most important symptoms. But beside those symptoms which are well known in this disease, there were others which made the case present a clinical picture so unusual as to raise doubts in the minds of the clinicians in regard to the justification for the diagnosis of general paralysis. These symptoms were such as belong to catatonia, as cataleptic attitudes, uncomfortable positions preserved for long periods, stereotyped automatic movements of the fingers, of the muscles of the face, grunting, stereotypies of language, negativism, suggestibility, pseudoedema, cold extremities—all those symptoms which are found in catatonic dementia precox in the half-stuporous phases. They were not transient in nature but persisted for months, and seemed to have no causal relation with the ictus or any discoverable exogenous or endogenous intoxication. In observations of cases of general paralysis with symptoms resembling catatonia which are to be found in the literature, the attacks are described as transitory and as occurring in relation with the ictuses or as consequence of uremic intoxication. Such cases have been described by Dupré, Trénel, Knecht, and others, and Seglas has also called attention to the fact that paralytic stupor simulates other diseases to such an extent as to sometimes make the diagnosis difficult. [J.]

BOOK REVIEWS

Seelert, Hans. VERBINDUNG ENDOGENER UND EXOGENER FAKTOREN IN DEM SYMPTOMENBILDE UND DER PATHOGENESE VON PSYCHOSEN. [S. Karger, Berlin.]

An interesting short monograph on the author's conception of the play of endogenous and exogenous factors in the pathogenesis of the psychoses that brings one not very far. This setting of opposites over against one another—the old—body, mind—exogen, endogen—play upon the meaning of words is rather tiresome when good paper could be used to get somewhere. The brochure has a lot of good clinical things in it but it seems to lack any real genetic insight. [J.]

Stookey, Byron. SURGICAL AND MECHANICAL TREATMENT OF PERIPHERAL NERVES. [W. B. Saunders & Company, Philadelphia and London, 1922.]

A brave book of 475 pages done in the best of bookmaking style, with rich and copious illustrations, bespeaking sound anatomical and physiological knowledge, industrious application of neurological principles to surgical technic, and withal a most admirable presentation by one of the younger generation. Admirable not alone from the generous proportions, as a book, but because behind it is found a rare combination of technical information and of philosophic understanding of the relationships that exist between the peripheral nervous system and the rest of the neural integrative factors which govern the functions of the entire body. Here may be read the mind of a surgeon who is not alone a disciple of the scalpel but of a philosopher working in the surgical domain. A *rara avis* in this "melting pot of nations," one who in his preface has the presumption(?) to state that faulty nerve surgery is inevitable if proper embryological, anatomical, and physiological criteria are neglected. Cutting is bad if fundamental considerations of such principles are neglected. To which the reviewer says "Amen."

The World War offered exceptional opportunity to the younger generation. The author is one who has profited by such opportunities and his book is replete with examples of such occasions courageously grasped and painstakingly followed up, so that his work stands on a par with that that has come from France, Germany and England. We cordially recommend it and wish it represented among the working tools of neurologists and neurosurgeons among our readers. Our review should not close without a word of commendation of the contribution of G. Carl Huber on Nerve Degeneration and Regeneration which is incorporated.

Guillain, Georges. ÉTUDES NEUROLOGIQUES. [Masson et Cie, Paris, 1922.]

This really gifted neurologist has here collected in book form a number of his contributions to nosology and semiology which have been heretofore available only in scattered publications. They deal with such problems as The Pathological Physiology of the Diphtheritic Paralyzes; The Fixations of Poisons in the Nervous System; Meningeal Forms of Cerebral Tumors; Epileptic Crises in Diabetes with Acidosis; Double Athetosis; Spasmodic Juvenile Astereognosis; and fifty-two other papers, classified under the broad headings of Fixation of Poisons in the Nervous System, Brain Pathology, Spinal Cord Pathology, Neurosyphilis, Pathology of the Cranial Nerves and Roots, Muscular Atrophies, The Cerebrospinal Fluid, Epidemic Encephalitides, and Intoxications.

Most of these studies have been in collaboration with his assistants and internes in that delightful old hospital, the Charité of Paris. They give us an insight into the kind of work for which French neurology is so justly renowned. They are full of ideas backed up by careful clinical observations. They are short, to the point, and stimulating. They are never prosy, yet rigidly accurate. It is a refreshment to read them and a delight to have them in handy form.

Kraepelin, Emil. ARBEITEN AUS DER DEUTSCHEN FORSCHUNGSANSTALT FÜR PSYCHIATRIE IN MÜNCHEN FÜNFTER BAND. [Julius Springer, Berlin, 1922.]

Organization has always been the genius of the Indo-Germanic races, and in the new Research Institute for Psychiatry in Munich it has begun to show what can be done for psychiatry.

As the reviewer is cutting the pages of this collection of studies the medical press announces the retirement of Kraepelin as Professor of Psychiatry in Munich to devote his entire energies to this new Research Institute. Bonhoeffer of Berlin has declined the offer to go to Munich from Berlin and Kraepelin's successor has not yet been named, but the Institute is already a thriving reality in spite of the war.

In the present report sixteen studies are collected and the proceedings of the meetings of the Institute report upon as many more studies. A great variety of material is offered showing the trends of psychiatric research stimulated by the genius of the Director which cannot be reviewed in detail in this place. We can only point out here and there some of the more noteworthy researches. Kraepelin has himself contributed to the problems of occupation psychology, and the pressure sense in the skin; Plaut has a number of contributions on the cerebrospinal fluid in which field he has made fundamental discoveries; Rüdin, Meggendorfer and Stüber summarize what geneological research can contribute to psychiatry; Spielmeyer, Spatz, Holzer, Sagel and Holzer present minute detailed analyses of histopathological alterations observed in the nervous structures in psychiatric patients; Lewy has a short presentation of his paralysis

agitans, Huntington chorea differentials, and a number of others take up chemical, psychological, clinical, and therapeutic problems, the whole making an excellent showing of contemporaneous German research into the problems of psychiatry.

Harrow, Benjamin. GLANDS IN HEALTH AND DISEASE. [E. P. Dutton, New York.]

The "Charge of the Light Brigade" is on us: "Glands to right of us, Glands to left of us" and "all the World Wonders." The endocrines have become the magician's wand, and, "presto," there you are! Ponce de Leon has returned and the Everglades of Florida have finally delivered up the secret Fountain of Youth. Indeed, it is rumored on the New York Rialto that the author of the Hairy Ape will set it to words and that New York's most intrepid and intelligent producer, Mr. Arthur Hopkins, is going to let us all see how it is done.

This somewhat ironic foreword to a book review really belongs possibly to the other of the Heavenly Twins, that had a previous birth from the same laboratory and which was perhaps more auspiciously reviewed in a previous number of the JOURNAL.

Yet of the two the present belated twin, while less picturesque and much less noisy, is really more sound than its predecessor. Harrow has actually written an excellent popular account of the endocrines.

We recommended Berman's book to our readers, to be read with caution. *Cum grano salis* is perhaps the apt phrase. Harrow's contribution needs no chlorides, it has Vitamines. Another of Ponce de Leon's fairies.

Freud, Sigmund. DIE TRAUMDEUTUNG. SIEBENTE AUFLAGE. MIT BEITRÄGEN VON DR. OTTO RANK. [Franz Deuticke, Leipzig v. Wien, 1922. 200 mks.]

A seventh edition of this fascinating and stimulating work has followed within a year of the appearance of the sixth edition from which it differs in but few respects. It also contains the valuable contributions of Otto Rank, and the literature of 1920 is conscientiously and fully collected.

Since Freud first demonstrated a practical method of utilizing dream material for the understanding of the activities of the human organism at levels where "the organism as a whole" is expressing itself, the applications of this method have brought about a wide reaching evolution in the understanding of the human psyche.

This understanding is enlarging daily and completely modifying the contours of our attitudes toward many vital problems of human conduct. The "Unconscious" has become a region in which far more can be found than even Freud himself at first dared to suspect—at least let it be said he was most conservatively modest about it if he did suspect it.

To every present-day student this volume stands as a monument of penetrating research. It remains as indispensable as ever and this new edition is welcomed.

Claude, Henri et Lévy-Valensi. MALADIES DU CERVELET ET DE L'ISTHME DE L'ENCEPHALE (Pedoncle, Protuberance, Bulbe). [J. B. Bailliere et Fils, Paris, 1922.]

Of the well known French Systems, that of Brouardel et Gilbert, revised by Gilbert et Thoinot, and now re-edited by Gilbert and Carnot, has stood out as preëminent.

This present contribution is Vol. 33 of the *Nouveau Traité de Médecine et de Therapeutique*, to which system the leaders of French medicine have contributed. It is the work of Henri Claudé, the newly appointed Professor of Psychiatry in Paris, and Lévy-Valensi, to judge by the excellence of this performance, an able coadjutor.

In a word, it is a noteworthy performance. It deals with the neurological disorders of the isthmus, the cerebellum, the pons, and the medulla. It is monographic in character, yet put in the textbook form, with a startling wealth of bibliographic citations which indicates a detailed consideration of practically every bit of contemporaneous research. All this has been critically appraised and ingeniously incorporated into a synthetic presentation of great value. It is not a critical digest alone that the authors have presented but a definite, carefully worked out series of chapters which may be regarded as monographs.

Diseases of the cerebellum take up 171 of the 440 pages comprising the entire volume. The authors have here followed the main themes already made known in the work of André Thomas, many of whose illustrations are utilized. [See André Thomas, *Cerebellar Functions, Nervous and Mental Disease Monograph Series No. 12*, and his *Étude sur les blessures du cervelet*, 1918, already reviewed in these columns.] In addition they have incorporated the most important researches of present day workers, among which American contributors, Seguin, Mills, Spiller, Weisenburg, Gordon, Schaller, Archambault, Dana, Church, Starr, Fry, Williams, Hunt, and others have not been neglected.

The corpora quadrigeminal involvements are taken up in the same painstaking manner, likewise the peduncular syndromes, in which latter chapters the excellent illustrations of Dejerine in his "Semiologie" are utilized with modifications.

The pons involvements make up the next chapter. Here the schematic diagrams are well chosen and are of great pedagogic value. Also the lesions of the medulla, in which chapter some excellent diagrammatic schemes are introduced showing the great advances in definite localization which the many war lesions have made possible.

The chapter on the Isthmus, with special stress laid upon epidemic encephalitis, is of exceptional value. The entire set of problems is most fully set forth. An excellent discussion of myasthenia gravis completes this valuable volume.

Enough has been said to indicate that in the reviewer's opinion the volume under consideration shows the best type of workmanship and is to be commended most heartily.

Guillain, G., Laroche, G., et Lechelle, P. LA REACTION DU BENZOÏNE COLLOÏDALE ET LES REACTIONS COLLOÏDALES DU LIQUIDE CÉPHALORACHIDIEN. [Masson et Cie, Paris, 1922.]

It is not more than a decade ago when certain idealists proclaimed that syphilis would soon become a memory of an age of unenlightenment through which the human race had passed. Then reality, in the form of the World War, thrusts its ugly form to the fore and forced the conclusion that the phantasy of these enthusiasts was nothing more than a fatuous desire to shut their eyes to the dynamic prepotency of the sensual obsession of a race still in its adolescent phase of psychosexual evolution.

Neurosyphilis again claimed the major rôle for the student of neuropsychiatry and any and all efforts which could aid in the solution of its diagnostic difficulties would be welcome. Hence this small monograph.

The laboratory workers evolved the Bordet-Gengou-Wassermann technic to fill the gap left by an anamnestic lying or ignorant generation. Newer technics arose to render more secure the frailties in the earlier efforts, and from these the present studies developed another attack on the problem of diagnosis. These authors show that a reaction based upon the gold sol method, as originally outlined by Lange, leaves much to be desired and that a similar reaction takes place if a colloidal suspension of gum-benzoin be employed in place of the gold.

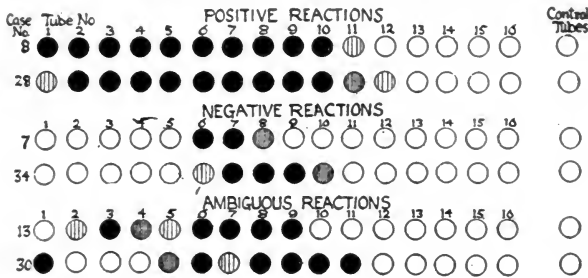
In the first place the reaction as originally suggested by Guillain, has a great advantage in its simplicity. A progressive series of dilutions of the cerebrospinal fluid, which should be free from admixture with blood, is made in a solution of sodium chloride containing 0.1 g. of the salt per litre of distilled water. The first tube of the series contains three parts of cerebrospinal fluid to one of saline. In the second tube the fluid is in a dilution of 1 in 2, in the third 1 in 4, and so on. The last tube (No. 15) contains cerebrospinal fluid in a dilution of 1 in 16,384 parts of saline. An equal quantity of a freshly-prepared colloidal suspension of gum-benzoin is then added to each tube, and a control of the suspension and the diluent alone is also put up. The test is allowed to stand at room temperature. Where precipitation is going to occur it rapidly becomes visible, the particles of benzoin flocculating and then forming a sediment at the bottom of the tube. The reaction can be read in a few hours but may be conveniently allowed to stand overnight, by which time sedimentation is complete in the tubes where this is taking place.

According to the authors of the test there is practically no precipitation in any of the tubes in cases in which the cerebrospinal fluid is normal. In parasyphilitic disease a precipitate is produced in those tubes in which the cerebrospinal fluid is most concentrated,

beginning with the first and gradually disappearing as the greater dilutions are reached. In meningitis a different type of reaction is said to occur, the earlier tubes being devoid of precipitate, but a zone of precipitation occurring in the succeeding tubes, which then tails off as in the former case.

With a colloidal suspension of Sumatra benzoin pictures, here reproduced, are obtainable.

Diagram Showing Types of Reaction.



The monograph then deals with the practical applications. In paresis, the results closely parallel the gold sol and Wassermann findings. In tabes, certain variations occur which seem to indicate that the benzoin test has certain advantages relative to the acuity of the tabetic process. In acute and chronic neurosyphilis again the acuteness of the process stands in quantitative relation to the test.

Other details are worked out in this very complete and accurate study which seem to point to the conclusion that the authors have made a real contribution to the solution of many diagnostic difficulties which previous methods, excellent in many directions, have left unsolved.

Pick, A. DIE NEUROLOGISCHE FORSCHUNGSRICHTUNG IN DER PSYCHOPATHOLOGIE, UND ANDERE AUFSÄTZE. [Verlag v. S. Karger, Berlin, 1921. Mk. 48.]

This makes up Vol. 13 of the Bonhoeffer "Abhandlungen," a series of many valuable monographs, many of which appeared during the war, some of which have escaped the reviewer's attention.

From the author's short preface it may be surmised that he is about to say farewell to his neuropsychiatric labors after a thirty-five year period filled with many profound and stimulating researches—Pötzl, of Vienna, is reported to have been called to take the chair—and he here gathers eight studies for consideration. Neurology in its Research Illumination to Problems of Psychiatry is his main theme. Then follow studies on Motor and Static Perseveration, Physiological Considerations of Apraxia (to which Pick has made fundamental contributions), Writing and Its Linear Variations,

Ribot's Law and Its Variations, Motor Aphasia, Striatal Problems of Motility, and Personal Observations on the Body-Soul Problems; these are the chapter headings under which this genial and highly cultured confrère presents his thoughts.

"Every neurological disorder is a gradient of a mental disturbance" is the "leit motif" of his first contribution. In this may be seen the general dynamic expression of modern medicine. Crudely expressed, in Hippocratic times, the "organism as a whole" is striving to carry out teleological goals. Creative evolution is the keynote of man's destiny and disorganization of the machine in some of its parts is the index of its adaptive maladjustment. With an admirable wealth of fundamental knowledge and a keen insight into the newer efforts at solving the complex problems of the synthetic processes that are present in the nervous system, Pick here presents a study of engrossing interest with extraordinary simplicity. Here is to be found ripe judgment and careful formulations which every neuro-psychiatrist can profitably read.

Much as we would like to discuss in detail his other studies we are constrained to point out only this opening essay as constituting the real message that Pick has offered. The whole volume is worthy of intimate presentation. This we leave to those interested in the parting words of a master and a choice spirit in the domain cultivated by neuropsychiatrists.

N. B.—All business communications should be made to *Journal of Nervous and Mental Disease*, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

The Journal

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Nervous and Mental Disease

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ORIGINAL ARTICLES

A CASE OF CONGENITAL MEGACOLON (HIRSCHSPRUNG'S DISEASE) ASSOCIATED WITH MENTAL DISORDER AND TERMINAL CEREBELLAR HEMORRHAGE

BY NOLAN D. C. LEWIS, M.D.

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Congenital dilatation of the colon has been described from time to time since Billard (1) (1820) and Parry (2) (1825) made the first recorded observations, and since 1880 it has been known as Hirschsprung's disease after Hirschsprung of Copenhagen, who later in the year 1886 gave the first classical description at a meeting of the Berlin Congress for Children's Diseases (3).

Griffith (4) in 1899 was able to find twenty-four cases in the literature and he also quoted twenty-seven additional ones, which, for reasons stated, he did not consider to be true cases of the congenital type although they were usually included by various authors.

Of these twenty-four cases only three were adults. (1) Peacock's case (5)—male twenty-eight years, (2) Formad's case (6)—male twenty-nine years, and (3) Hitchen's case (7)—male twenty years, and of the number of cases reported up to that time only four were females with the majority of all patients under ten years of age.

Lewitt (8) of Chicago was the first to record a case in this country, and Finney (9) in 1908 was the first in this country to review the literature to date and to write a complete account of the disease.

Yearly, a number of articles from many countries are appearing

in the literature but since few of these patients reach adult life and to my knowledge no case occurring in a hospital for mental disorders has been thoroughly described, it was thought advisable to publish this case in full, particularly as there are in this instance many associated features of interest.

Scandinavian, male, age fifty, single, coal miner. Mental Diagnosis: "Psychosis of degenerates." Duration of Psychosis: Fifteen years. Pathologic Diagnosis: Congenital megacolon with terminal cerebellar hemorrhage.

Family History: Father was an alcoholic, one brother and one sister died with tuberculosis. Further information regarding the family was not available.

Personal History: He was born in Sweden and as a child was, according to his own statements, free from convulsions and diseases of infancy and childhood. He began school at six years and continued until fifteen, but he was dull in studies, claiming that he "didn't care for books." After leaving school he worked in a lumber yard until he was seventeen and then in the mines until twenty-one, when he came to the United States.

His first heterosexual relation was at fourteen, and after this initiation he had intercourse every two or three days and also masturbated for several years. He said that he could not marry a woman as he was unable to save money enough to support her, but since coming to this country he thought he had adequately adjusted himself by going out to see a woman every pay day.

The patient began to drink at fifteen, and indulged excessively, keeping up his alcoholism for a number of years. He had typhoid at twenty-three and soon after this had a homosexual episode, he being the passive agent, but he claimed that he "wasn't a sodomist but that they were just fooling and drunk." Subsequent episodes were denied. At the age of twenty-seven, while working in the mines in this country, a strike occurred and finally being out of money he with two others held up a train. They went through the baggage car and mail where they took the money from a registered letter and escaped. They were caught later and he was imprisoned in the Atlanta penitentiary where he remained for six or eight years before sufficient mental symptoms developed to warrant his transfer to the Government hospital.

He thought it a mistake to consider him insane merely because he urinated on the floor and fought with the attendants. In justification of this conduct he gave two reasons, one was that urine smelled good "like burnt sugar" and the other was that he "didn't feel well in the belly" if he urinated elsewhere. This also relieved his head from a pressure sensation. While in prison he had auditory and visual hallucinations and thought that these originated from spirits "like a fog."

He was admitted to St. Elizabeth's Hospital in 1907 with a history of being unbalanced on two previous occasions when he would

refuse food, develop "static ataxia," show indifference to surroundings, and refuse to converse with anyone for three or four weeks.

Three years before, he was considered to have symptoms of epilepsy as he often complained of headaches, nervousness and dizziness, and on several occasions had lain flat on his back for twenty-four hour periods without speaking, eating or drinking, associated with an occasional frothing at the mouth. At the time of admission he was described as being a medium sized, well built and well nourished man with large muscles, but with the tone diminished. There were a few scars in various positions on the body. His bowels were constipated, but there were no significant findings in the abdomen, and no other important features were discovered physically, excepting there was an absence of the right testicle. When admitted to the hospital he was imperfectly oriented, the facial expression was one of indifference, the memory seemed to be impaired for recent and remote events, and he admitted these failures, claiming to have difficulty in thinking.

Progress of Case: He had auditory, visual, and gustatory hallucinations, hearing and seeing both evil and good spirits and tasting something bitter which he thought was strychnine in his bread, meat and drink placed there in attempts to poison him. He developed delusions of persecution and was very suspicious. He thought electricity was passed through him and through his head in order to torture him—people also stole his thoughts, read his mind and were wont to say all sorts of evil things. He also stated that some kind of a current was forced into him which at times passed upward and nearly choked him, so that he had to stand up for relief. At other times the current would pass downward and he had to sit down for relief. All this was attributed to some evil influence. His habits were tidy and he slept well and usually was emotionally indifferent, but occasionally appeared very nervous, and obstinate, sometimes striking at the attendants. He often assumed peculiar attitudes and was then negativistic.

The patient kept on in the above manner for a number of years during which time he was said to have had many attacks of acute abdominal distention in which the outlines and the peristalsis of the intestine could be observed on the abdominal wall. He had an unusually severe attack of ileus in 1916 and an operation was considered necessary but the acute distention was relieved by rectal tubes without surgical interference.

In 1920 he complained of not feeling well, that his head felt heavy, in fact it had felt that way for years, sometimes alternating with periods of lightness. He often spoke of feeling sad and afraid, and believed he would never get well because he had a "bad stomach."

During 1921 he seemed to be afraid of everything and presented a chronic distention of the abdomen, which fact he accounted for by saying "Too many sit in my abdomen." "They get through my seat and into my belly." "I don't notice who they are, but when they get up there I am afraid." One night he believed somebody

tried to have intercourse with him through the rectum, but claimed he didn't like it (phantasy or fact?).

In December, 1921, this man became suddenly ill, complaining of pain in his "stomach," and when examined his abdomen was found to be tremendously distended as had been the case in several previous attacks, but this one seemed much more severe than any of the others. His pulse became weak and rapid and signs of shock quickly developed. Enemas were given without relief, and he rapidly failed and died.

The routine laboratory examinations were always negative.

Necropsy: The body was that of a middle aged man showing a moderate generalized pilosity and a tremendous distention of the

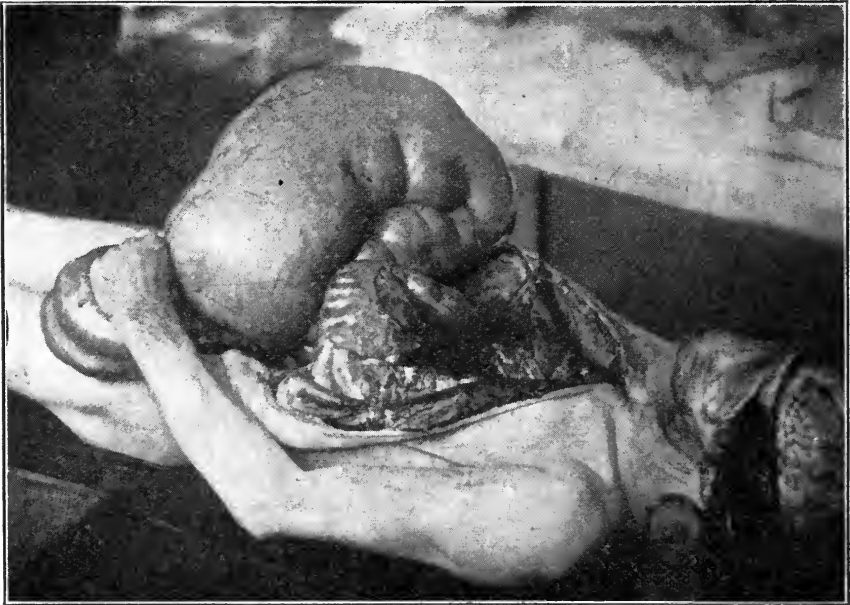


Fig. I: View of the huge pelvic colon filled with gas.

abdomen. The abdominal walls were thin, the muscles being unusually so and exhibiting fibrous replacements. The other skeletal muscles were fairly well developed. The costal angle was greatly widened and the diaphragm was thin, showing an atrophy of the muscles of the left side where the greatest pressure from the abdomen had been brought to bear.

The abdominal viscera were displaced, and the space largely occupied by an enormous pelvic colon. The walls of the rectum were universally $\frac{3}{4}$ c.m. thick but the gut was not dilated; however, at the brim of the pelvis the intestine suddenly passed into a huge pelvic balloon, involving the entire sigmoid loop which had forced itself upward, occupying the upper half of the abdominal cavity. The

convexity of this loop measured 1 meter, the lower end at the rectal junction measured 52 c.m. in circumference and the upper end near the descending colon, 47 c.m. in circumference. The walls of this loop were universally greatly hypertrophied, and particularly were

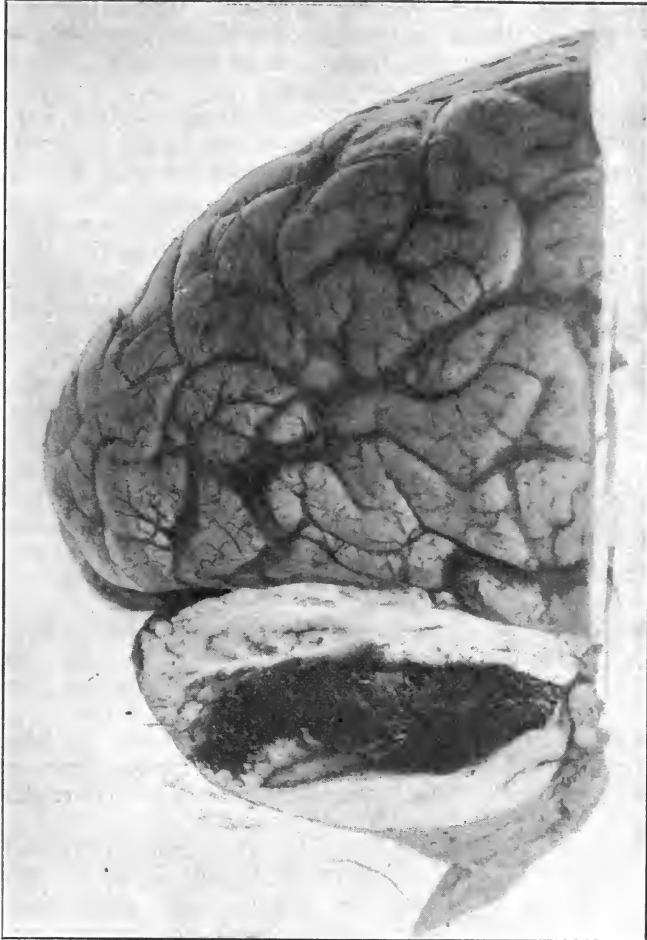


Fig. II: Photograph of the hemorrhage into the central area of the right cerebellar hemisphere, showing pressure on surrounding areas.

the teniae coli prominent throughout. Gas and very little liquid fecal matter composed the contents of this section. This dilated structure rather abruptly changed at the sigmoid flexure and the remainder of the colon as far as the ileo-cecal junction was nearly twice the size of the normal, this being due to hypertrophy of the muscular walls and not to gas content. The mucosa was hyper-

trophied but not ulcerated. The stomach was behind this mass and was empty and collapsed, and the small intestine was normal throughout excepting for displacement due to local pressures.

The liver weighed 1600 grams and was forced upward and backward upon the diaphragm, which was under tension; the liver itself being adherent to all surrounding structures. The substance contained a large amount of residual blood and was somewhat swollen, the lobules being indistinct. Diffuse, early interstitial changes were apparent. The gall bladder was normal.

The spleen weighed 230 grams and showed diffuse interstitial changes and a high content of residual blood.

The pancreas showed some post mortem autolysis, but was not remarkable otherwise.

The left kidney weighed 180 grams, and the organ was thin and flattened, having the appearance of weighing much more. The right weighed 150 grams and seemed much smaller, as the contour was rounded and the longitudinal diameter shortened. This kidney was jammed against the lower surface of the liver and the right adrenal was situated in a small pocket of fascia between these two organs. Both kidneys were congested, the capsules were slightly adherent, and the cortices were finely granular and cloudy, showing both acute and productive changes.

There was but one testicle, and that the left. There were no signs of spermatic cord structures on the right side and the abdomen was searched for an undescended or misplaced testicle, but none was discovered. The left testicle was somewhat larger than usual but the structure was soft and flabby, the tubules rupturing easily. The penis was normal.

The adrenal glands were broad, flattened, extremely pale, disclosing a thin cortex, the surfaces of which presented patchy glandular hypertrophy. The medullary areas were of a normal grayish white color.

From the tremendous pressure on the diaphragm the heart was pushed upward with apex far to the left. The pericardium was thin but otherwise normal. The heart was in a state of firm contraction, the muscles apparently being in extreme rigor with the mitral valve cusps contracted, and the left ventricle structure considerably hypertrophied. There was a general chronic interstitial myocarditis with hypertrophy of the right auricular appendage and some sclerosis of the aortic valve and of the arch of the vessel.

Lungs: The left lung weighed 460 grams, was filled with blood and was tightly adherent over the entire surface by numerous small, well organized adhesions. The lung substance was dark, being heavily anthroctic, sections disclosing an unusual amount of exogenous pigment, some terminal congestion and considerable chronic interstitial pneumonic productions.

The right lung weighed 510 grams and was entirely free from adhesions in the pleural cavity but the substance showed throughout the same changes as those described above for the left. There was

no evidence of bronchopneumonia or other acute lesions. The trachea and bronchi were filled with mucopurulent exudate.

Thyroid: This gland was very dark in color, containing much blood and on section disclosing a large amount of fibrous tissue replacement, there being very little colloid visible in any portion of the structure.

Head: The scalp was filled with blood which oozed profusely on section. The sinuses were also filled with semi-fluid blood.

Pituitary: This gland was situated in a deep roomy fossa which, however, exhibited some absorption of the posterior wall and an irregular bony thickening of the anterior clinoids. The gland was flattened and pale, the anterior lobe being notably diminished in size.

Brain: The brain weighed 1470 grams and the overlying dura mater was dry, sticky, and slightly adherent to the pia. The underlying cortex of the hemispheres was brightly congested and was under considerable pressure with all of the peripheral vessels undergoing arteriosclerotic changes to the extent that even many of the small capillaries were affected with plaque formations. The base of the brain seemed swollen, boggy and oedematous and the right lobe of the cerebellum was enlarged and contained a large hemorrhage, clots from which had ruptured through the posterior leg area, separating the leaflets of the lateral lobe. The amygdaloid lobes of the cerebellum as well as the entire pons structure were greatly swollen.

Brain sections disclosed a moderate amount of general dilatation of the lateral ventricles and some congestion of the central structure, but gross examination discloses only a mild general atrophy of the cortex. No gross arteriosclerotic changes in the cerebral tissue were noted. Sections of the right lobe of the cerebellum showed a large central area of hemorrhage which had destroyed the central cerebellar substance including the dentate nucleus of that side with a compression of the surrounding tissues forcing the roof structures downward upon the floor of the fourth ventricle. All of the cerebellar vessels, but particularly the inferior cerebellar arteries showed advanced arteriosclerosis with alterations in the courses and much distortion.

Summary of Microscopic Examinations: **Pituitary Gland:** The anterior lobe was composed of irregular sized acini, many of which were heavily sclerotic, showing a basophilic reaction in the cells. There were some local glandular hypertrophies and throughout the entire anterior lobe there was a thick felting of interstitial tissues. The pars intermedia was greatly overgrown and the posterior lobe was congested and very fibrous. Capsule of the entire gland showed fibrohyaline changes. Sclerosis with local compensatory hypertrophies were the characteristic features.

Thyroid: The substance showed considerable interstitial sclerosis of a general and evenly distributed character. The acini were small but most of them contained colloid while there was an overgrowth of epithelial cells through the interstitial areas and in some acini there was a tendency on the part of the chief cells to assume high cuboidal shapes. On the whole the number of acini and the amount of colloid

were reduced throughout. The vessels showed arteriosclerosis, with general thickening of the walls.

Adrenals: The capsule was normal, but there was some sclerosis of the upper cortex. There was a deficiency in development in the width of the cortex, the middle zone being the only one which was prominent and well defined while the inner and the outer zones were narrow and contained very few cells. The medulla was hypoplastic and contained but few ganglion cells.

Pancreas: Appeared normal microscopically with the exception of some distortion of the islands and of post mortem changes which were advanced in some of the lobules.

Heart: The coronary vessels showed some thickening of the walls and this of an irregular distribution. The heart muscle presented a moderate amount of interstitial replacement and the muscles were not well stained but showed some acute cloudy features.

Lungs: These sections presented no acute changes but there was a general thickening of the walls of the alveoli with patches of dense interstitial tissue replacement. In places there was a very heavy pigmentation accompanied by dense sclerosis of the structure. This pigment was true anthracosis, due to the inhaling of coal during several years of coal mining in which the patient was engaged. There was a marked amount of congestion with all alveolar arterioles as well as the larger vessels clearly distended, and in the walls of the larger vessels were deposits of coal pigment, often completely outlining the walls.

Section of hypertrophied wall of intestine: Both the inner circular and the outer longitudinal muscular coats were enormously hypertrophied, the muscle bundles being unusually large and numerous. The submucosa was also increased and sclerotic, containing many thickened vessels and the mucosa showed elongated large glands and much interglandular cellular supporting tissue. The lumen of the gut was filled with various types of round cells and detached columnar epithelial structures.

Liver: Presented nothing remarkable microscopically.

Spleen: Showed an increase in interstitial structure and also much blood pigment and hyaline alterations in the vessels throughout. Malpighian bodies were very small and few in number, they having been destroyed in the general sclerosis of the substance. This sclerosis was probably due to pressure changes brought to bear upon the organ during a number of years.

Kidneys: The glomeruli were all well formed but showed acute congestion. Streaks of interstitial replacement radiated through the cortex, involving many tubules and some glomeruli. The vessels were in stages of advanced arteriosclerosis, some being completely obliterated. There was a dense fibrosis in the collecting tubule regions and all vessels were markedly congested. In patches there were new vessel formations and where this was present the congested vessels gave a very unusual appearance in that the numbers were extraordinary. The cells of the tubules exhibited a moderate acute cloudy swelling. Both kidneys appeared the same microscopically

and the changes were principally those of a patchy productive nephritis with the collecting tubule regions affected more than the other areas. A few hyaline casts were seen.

Prostate: Normal microscopically.

Testicle: The testicle was composed of numerous well shaped large tubules in which the cells were in active stages of division. Spermatazoa were fairly numerous, but many of them had rounded heads and were of peculiar shape. The walls of the tubules were thin and sclerotic and there was apparently very little increase in the interstitial tissues although early sclerosis of the vessels was present. Large patches of epithelioid cells were noted in some areas between the tubules, these representing either the interstitial cells of Leydig or were remnants of embryonic structure. Spermatazoa were not as numerous as in a normal testicle.

Cerebral Cortex: The meninges showed a moderate thickening, but the principal change in these sections was seen in an occasional vessel, the walls of which were sclerotic and surrounded by an area of altered cerebral tissue in which neuroglia were very numerous. The cerebral vessels were everywhere brightly congested and in places the smallest capillaries showed thickening in the walls. Ganglion cells were not markedly altered but they exhibited some disturbance in the arrangement of pigment.

DISCUSSION

I. The psychosis of this patient does not easily fall into any of our workable classified groups, since we are here dealing with an unusual mixture of epileptic, organic, and schizophrenic manifestations.

The labeling of this case as a psychosis of degeneracy or "delire de degeneres" of the French, may require some explanations. This symptom group was described by Birnbaum and by Hoche and refers to a type of individual whose distorted mechanisms often resemble those of dementia praecox, producing clinical difficulties in differentiation. These individuals differ from the shut-in personality by possessing an ill directed aggressiveness, their make-up is unstable with shallowness of feeling and tendency to outburst. They are fickle, suggestible, eccentric, unable to stick to any occupation and their conflicts are on the surface.

In our patient we find many elements of this type of constitution, particularly his lack of adjustment, to the school, the frequent changing of jobs, alcoholism from youth, and the criminal offense which brought him into conflict with the law resulting in imprisonment, thus producing a situation suitable for the full blooming of a latent or budding disorder.

II. In the literature on megacolon, there are four groups of cases described.

(a) Cases in which at birth or during the first few days there are obstruction and marked distention of the abdomen (Megacolon congenitum).

(b) Cases in which the condition develops at the time of weaning or of adding solid food to the diet.

(c) Cases that develop years after birth.

In these cases there is a history of constipation for a number of years. They have enormous distentions of the abdomen, and are the "balloon men" and "human bass drums" of the circuses.

(d) A group of cases in which the symptoms develop late in life—after forty-five years of age.

In our patient the development of the condition many years after birth, the history of constipation and of periodic attacks of great distention, justify placing him in the third group (c) of the classification.

III. The chief physical sign is the extreme abdominal enlargement with the upper half of the abdomen particularly affected, the lower thorax widened and an increase in the umbilico xiphoid measurement. Patients with megacolon are always in danger of ileus (Frank) (10) and are constipated, and acute attacks of pain occur with dilatation of the colon so that the outlines of the teniae coli and haustra coli can be distinguished, as well as a slow visible peristalsis, with alterations in shape of the abdomen. These attacks are sometimes relieved by diarrhoea or by artificial emptying of the bowel.

This abdominal enlargement is often symmetrical, but usually there is more prominence in the left iliac region, and the abdominal walls may be flaccid. This often looks like the distended stomach with dyspeptic and colicky pains associated with malnutrition.

There may also be considerable pressure on the diaphragm, with displacement of the heart upwards giving rise to palpitation, dyspnoea and cyanosis. (Hawkins.)

IV. Pathology: In nearly one half of the reported cases the sigmoid flexure is alone involved, the entire large intestine in about 15% of cases, and the rectum and small intestine practically never. The walls of the gut are thickened sometimes to the extent of one fourth inch and in acute distentions may be dilated to from 15–30 inches in circumference; these walls are usually rigid, showing little tendency to collapse. The thickening of the intestinal walls is principally a compensatory hypertrophy affecting both muscular layers; the mucosa is often inflamed or ulcerated or presenting submucous abscesses.

The distended bowel may contain gas or feces, and cases have been reported of patients retaining from fifteen to forty-five pounds of fecal matter.

V. Pathogenesis: Very little is known regarding the origin of this disease but some of the theories are worth consideration.

Hirschsprung suggested the idea of the congenital origin of the disease. He believed that both the dilatation and the hypertrophy are due to an anomaly of development or perhaps some morbid process acting during foetal life. Marfan regarded the dilatation as secondary to congenital anomaly in the form of the sigmoid flexure.

Hawkins (11) (1907) considered that it was a neuromuscular defect in one segment through which the colon was unable to push its contents, thus causing functional hypertrophy of the walls of the segment preceding the paralyzed one. To this congenital nervous defect in the lower part of the colon with hypertrophy he gave the name "neuropathic dilatation and hypertrophy of the colon."

Anatomical kinking has been thought to explain the condition and Roser and Perthes (12) lay stress upon the formation of a valve which prevents the contents of the intestine from passing into the rectum.

Bing (13) thought it due to changes in the sympathetic connections of the intestine, and Fitz (14) pointed out the close relationship between this condition and the phantom tumor.

In Finney's report emphasis is laid upon the fact that in the cases studied, the plexuses of Meissner and Auerbach are intact and healthy, and that histologically the ganglion cells belonging to the nodes of the Auerbach plexus are normal, and if anything are in larger clumps and in a better state of preservation.

VI. Analysis of Case: In 1920 Pende and Fici (15) commented on the possibility of light being thrown on the origin of megacolon as well as other malformations when several happen in the same subject and they described a case of status hypoplasticus with diffuse gliosis of the spinal cord and congenital megacolon which had caused no special trouble except persistent constipation until the thirty-sixth year when ileus developed and was rapidly fatal. Popper (16) reported an instance of congenital megacolon in female twins, the condition being present at birth.

Our own case is of interest from an embryological standpoint, as we have here an individual with more than one congenital malformation. It is necessary also to direct our attention to an early

stage of embryonic life in order to account for an abnormality in the lower intestine associated with the absence of a testicle and an aplasia of the kidney.

It is known that large primordial germ cells are found in 2.5 m.m. embryos in the entoderm of the future intestinal tract (Fuss) and that at 3.5 m.m. they migrate into the dorsal mesenteric epithelium, from which they pass into the epithelium of the genital fold. The germ cells of the genital glands are probably descendants of these elements.

The following idea based upon changes which occur at the twenty-eighth to thirtieth day of fetal life involves considerable speculation, which, however, may be justifiable, considering the origin of the disease is so obscure, but it seems to us that a failure on the part of some of the primordial cells to migrate from the growth area of the future intestinal tract might well account for the overgrowth of some section of this structure, as well as their absence accounts for those deficiencies in the urogenital anlage of our case:

The other reported congenital cases might be accounted for by the different possibilities of distribution of the primordial cells in these early embryonal stages, with many of the defects produced or accentuated by the mechanical and environmental effects of post natal life. So we have in our patient a congenital defective basis for the developing of at least physical and perhaps mental symptoms later in life.

The physical symptoms in this patient were apparently very slow in development, but were for a considerable period likely the basis for many of the peculiar feelings of pressure located in the abdomen, and in the head, as this huge pelvic colon when even moderately dilated must have produced much pressure on the abdominal organs as well as on the splanchnic area forcing blood by back pressure to the head area. A delusional system could easily have been built up about these sensations and the congestion of the cranial areas might well have produced headaches, dizziness and mild epileptoid attacks.

There was a sufficient cerebral arteriosclerosis to account for most of the organic expressions such as the thinking difficulties and memory impairment.

Some of his schizophrenic traits and particularly the currents which choked him were doubtless due to waves of pressure upon the diaphragm as were also the feelings of fear due to compression of the thoracic contents.

The following table illustrates the possible relation of the anatomical condition and the mental developments:

TABLE I.

<i>Behavior</i>	<i>Pathologic Physiology</i>
Claim that urinating on floor relieved pressure in head and made him feel better in the belly.	Relief produced by emptying full bladder, thus allowing dilated colon to retract from under surface of diaphragm and to ease up on splanchnic vessels.
Epileptoid symptoms. Headaches—dizziness—semicoma—frothing at mouth.	Cerebral irritation symptoms produced by mechanical abdominal pressure forcing excess of blood to brain.
Organic features. Difficulty in thinking—memory impairment—imperfect orientation.	Changes produced by prolonged cranial hypertension—Cerebral arteriosclerosis—terminal hemorrhage.
Feelings of electricity. Head and abdominal sensations. Currents—mind reading—choking sensations. Hallucinations—delusions of persecution.	Ileus and movements of gas through the intestines with pressure on the diaphragm—thoracic and abdominal viscera and on the great vessels, all of which were attributed to an evil influence.
Fears—afraid of everything.	Pressure on thoracic organs.
Delusion of too many people being in the abdomen.	Sensations from chronic abdominal distention.

From a psychological viewpoint one might sum up this case in a somewhat different manner. If the primordial germ cells originally intended for migration and formation of the genital apparatus remained in this segment of the intestine we then have not only the possibility of increased and abnormal growth of the intestinal walls but we have misplaced elements carrying a portion of the potentiality and energy of the normal sex glands, therefore, why not the development of an erotic focus of some importance?

It is to be regretted that the patient's overt anal erotic activity as well as phantasies and behavior were not more thoroughly investigated early in his psychosis before deterioration was advanced. The recorded instances of anal erotic activity with the associated circumstances merely show a partial expression of certain tendencies. In segregation, overt anal eroticism as well as other forms of perversion, may be utilized as converted or morbid adjustments.

However, an early analytical survey of the patient might have revealed the persistence and growth of youthful fancies pertaining to pregnancy and the growth of a child, as frequently in boys who are the passive agents in seduction we have the development of worries regarding the outcome, with its fancied possibilities of pregnancy.

It is well known that the wish has produced dilatation of portions of the colon in the form of pseudo-abdominal tumors, and particularly in the so called "phantom pregnancies." In fact as mentioned before Fitz has drawn attention to the similarity of these phantom tumors and megacolon. So the wish in phantasy might be held

accountable for many of the symptoms of megacolon in the individual who is constipated, undoubtedly passively homosexual, and may unconsciously desire the biologic results (pregnancy) of sex activity.

In this patient we have many complex problems which by an early thorough study of the personality could doubtless have been made much more understandable than is possible with the present limited material for presentation, but withal the problem is interesting as we have here a man with anatomical deficiencies, early maladjustments to environment with later formation of delusional systems with classical organ inferiorities and finally death from cerebellar hemorrhage, the result of the combination of arteriosclerosis and acutely increased intracranial pressure.

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St. Elizabeth's Hospital.

GERMAN RESEARCH INSTITUTE.

BY PROF. EMIL KRAEPELIN

MUNICH.

SECOND REPORT OF THE DEUTSCHE FORSCHUNGSANSTALT FÜR PSYCHIATRIE IN
MUNICH, PRESENTED AT THE MEETING OF THE BOARD OF
TRUSTEES APRIL 30TH, 1921.

The period that has elapsed since the last meeting of the Board of Trustees, on January 3, 1921, was, in the main, one of quiet, though, in many respects, greatly retarded development. Of the two wide breaches which the death of Nissl and Brodmann had caused in the structure of our institute, the former could naturally not be closed. In accordance with a rule which ought to obtain in every institute of research, the first histopathological department had, from the outset, been especially created for science as embodied in Nissl's person; perforce it had to be absorbed by another similar department, when that master-mind was taken from us. The case was somewhat different with Brodmann's department of topographical histology of the cortex. True, we could not have thought of establishing this department, had we not been able to secure the services of so eminent an investigator as Brodmann. But we were also faced with the urgent need of giving mental science the benefit of the special and peculiar aims which his methods of investigation pursued. We were therefore constrained, if in any way possible, to find an immediate successor. But unfortunately all our efforts proved unavailing. There is, at present, no one in Germany or anywhere else, whom we could secure, or who would be able to carry on topographical-histological work according to the methods of Brodmann. So we have, with a heavy heart, been obliged to decide to discontinue his department. Let us hope that among those who are now in an early stage of their scientific career some may develop a genius for investigation capable of taking over Brodmann's heritage.

Considerations of a less intimate kind prevented us from establishing the chemical department which we had planned. It was clear that without very thorough work in chemistry, wide areas of our investigations could not be made accessible. In our attempts to penetrate farther into the real nature of morbid changes in the brain we are frequently brought face to face with questions involving

colloid-chemistry and proteid-chemistry. Of course, it is only possible for investigators of the highest order and for those who have at their disposal unlimited scientific resources, to work in this field with reasonable expectation of success. Indeed, it is doubtful whether the possibility exists at all to-day to attack the uncommonly complex problems which await solution. We were therefore obliged to limit ourselves to bio-chemical investigations. But here, too, after close study, we found the difficulties that stood in the way insurmountable. At present we are not in a position to raise the funds needed to secure the services of a preëminent scientist, and especially for carrying on a department that would serve his ends. Besides, the space which is at our disposal in the Clinic is too limited to allow of scientific work on a reasonably satisfactory scale to be conducted. After careful consideration we were therefore obliged to abandon this plan as well and to be content to use the available space for such chemical work as is possible with our present means. We were fortunate in finding in Dr. Wuth an experienced chemical assistant who was also willing to pay for a part of the cost of the scientific work out of his own pocket. Provisionally his work was made a part of the serological department.

We were forced to abandon still another hope, namely, that of soon erecting a new building for our institute. Under prevailing conditions there can, of course, be no thought of securing a new reception department for psychic patients, and this fact, for the present, precludes the possibility of removing our institute from the rooms it occupies in the Clinic, however narrow they have already grown for our constantly expanding needs. Nor would our means allow us to build our own home, nor, above all, to maintain it independently. However unpleasant it may be, we shall be obliged to avail ourselves, still further, of the hospitality of the Psychiatric Klinik, and it will therefore be necessary to continue the conditions of such joint tenure which we were at the outset justified in regarding as quite temporary, for a longer period. We are not blind to the serious difficulties which this involves, but we hope that, for the sake of our common great aims, with the exercise of good will by all concerned, they may be overcome.

The increasing depreciation in the value of money and the resultant rapidly growing cost of living have brought our Institute the same serious embarrassment which it has occasioned German science generally. Notwithstanding most careful retrenchment, our cost of operation was $2\frac{1}{2}$ to 3 times larger than in the year previous. This is especially fatal in an institution which depends not upon

state subventions but upon private gifts. Our situation is all the more serious as poverty-stricken Germany cannot under the present conditions be counted upon for more generous support. Every possible attempt was therefore made to improve the state of our Institute; we appealed to the American Aid Society for European Science and Art, and also joined the "Notgemeinschaft der Deutschen Wissenschaft."

No doubt, there exists in many quarters a readiness to help us, but the demands which come from all sides are of course so very great that we cannot entertain too high hopes for a radical improvement of our condition from these sources. The most effective means of furthering our aims has always been, and still is, personal appeal to people who take an intelligent interest in our science.

Thus we are now able to record the gratifying fact that since our last meeting more than 1½ million Marks have been presented to us. Of this amount Mr. James Loeb, the first energetic sponsor of our Institute, gave about 515,000 Marks—and Mr. Alfred Heinsheimer 700,000 Marks—which latter were added to the Natalie Heinsheimer Fund. Further gifts were received as follows: 50,000 Marks—from Frau Geheimrat Schwabach in Berlin, 15,000—from Herr Wieler in Constanz, 10,000 Marks from Herr Hardt in Lennep, the same amount from Dr. Neuburger in Frankfurt, 14,000 Marks—from Baron v. Cramer-Klett, in Hohenaschau, 3,000 Marks—from Herr Gruss, in Munich, from Frau Dr. Teusch, in Munich, and smaller amounts from Professor Dr. Spielmeyer, Dr. Arndt, the Natural Science Society of Straubing, and from a few other sources. Special mention should be made of a gift of 50,000 Marks—in memory of Miss Emilie Kuhn, on March 4th, which is intended as a most noble memorial of a deceased lady. Finally larger sums were turned over to us out of the income of the brandy monopoly, which will give us the very welcome possibility of making more elaborate scientific investigation of the harm done by alcohol. In face of the above recorded gifts it would be wrong to despair of the future of our Institute. We need hardly say that we are most grateful to all who have helped us with their gifts.

For our future illustrative exhibition we received through the mediation of Dr. Lemberg, the head physician at Eglfing, a collection of handiwork made by patients. Professor Bödeker, in Berlin, gave us busts of Griesinger and Westphal. Books were presented by Frau Professor Möli and Hofrat, Dr. Löwenfeld and the director of the Institute gave us a number of works on psychiatry. Our library can thus record an increase of about 1,200 volumes. Most

valuable are the manuscripts and letters left by Bergmann and Damerow, which Dr. Mönkemöller and Geheimrat Dr. Lähr sent us. Professor Lähr also gave us manuscripts and letters left by his father, and from Prof. Dr. Berger we received an interesting "book of rules," used in the Jena Clinic in 1851-2. We hope that, as far as possible, our colleagues will turn over such treasures to the Institute so that they may be kept here as a contribution to a history of psychiatry which is to be written later on. Our collection of portraits of eminent alienists was enlarged by various gifts, more especially by those presented by Frau Professor Möli, Geheimrat Professor Westphal and Sanitätsrat Dr. Kahlbaum. Furthermore Medizinalrat Dr. Fischer in Wiesloch, allowed us to make copies of pictures contained in the large Schüle-Album, while Dr. Thoma in Illenau placed the Roller-Album at our disposal for the same purpose. We now possess a total of 248 pictures of German alienists, portraying in all 160 persons. We have 60 pictures of foreign alienists.

When one takes into account the extremely unfavorable prevailing economic conditions, the fact that we can record a great increase in the use of the laboratory facilities placed at the disposal of scientific workers, may be regarded as a very encouraging sign. For shorter or longer periods nine gentlemen worked in the anatomical department, seven in the genealogical department, while there were three in the clinical division and one each in the serological and psychological department. In the latter there were, in addition, eight students, at whose disposal we placed the scientific apparatus of the Institute. We have, even at this early stage, gained the impression that this arrangement is working excellently, as it brings us valuable helpers and in many ways stimulates scientific activity. And so we may well hope that the corporations which have hitherto lent us their support by renting laboratory places, will continue, even in face of the unfavorable times, to value this arrangement so highly that they will abide by it, and that others who have hitherto hesitated will decide to thus contribute to the progress of psychiatry.

The impulse given scientific work by a large attendance on the part of investigators has more and more accentuated the need of appointing permanent scientific assistants as helpers and representatives of the heads of departments. Unfortunately our means have for the present only allowed of our making such an appointment in the anatomical department; and this was given to Dr. Spatz. In the remaining departments we could only secure the services as an incident of their work in the Clinic, of Dr. Lange for the psychologi-

cal, and of Dr. Wuth for the serological departments, while Dr. Kahn worked in the genealogical and the clinical department, in which latter he had Frau Dr. Schmidt-Kraepelin, as his assistant.

The enormous outlay also obliged us to limit the number of technical assistants. At present the anatomical division employs two women as assistant and one as photographer, and a man servant; the serological division employs two women assistants; in the genealogical division there are three typewriters, in the clinical division two, while a woman assistant was temporarily employed in the psychological department. And finally the making of our library catalogue is in the hands of one typewriter. In addition to these Dr. Wuth has, out of his own pocket, placed at our disposal two assistants for his work in chemistry. It is most desirable that, in course of time, we may have a freer hand in appointing such workers.

Aside from the regular day's work, the scientific life of the Institute chiefly found expression in the meetings which were, as a rule, held every second week. Here reports were given of the results of the investigations in the various departments: the "*Zeitschrift für die gesamte Neurologie und Psychiatrie*" publishes short abstracts of them. As gentlemen from town and the surroundings are regularly invited to these meetings, they are often very stimulating.

The detailed publications of the Institute, a large part of which have appeared in the above journal, were collected in a volume which was sent to the members of the Board of Trustees, to other institutions which pursue similar aims, to scientific societies and finally to the journals with which we regularly exchange. A second volume of these articles has just been completed and it is expected that a third volume will be issued in the course of this year. We have arranged to provide for a small number of copies beyond those actually needed by us; they are to be obtainable in the bookshops.

These publications supply us with a means of gradually resuming our scientific relations with foreign countries. Hitherto we have met with friendly response in Holland, Sweden and Spain; relations have also been reestablished with the United States, Argentine, Chile and Italy. Indeed a Finnish colleague has engaged a laboratory place in our laboratories. At present we are receiving scientific journals from the United States, Brazil, England, Holland, Italy and Spain.

In speaking of the scientific work we have undertaken mention must be made of a book on German Alienists, which Professor Kirchhoff in Schleswig, has engaged to prepare.

This book was suggested by the address delivered in the first public meeting of our Institute which gave an account of the development of psychiatry and more particularly of German psychiatry, and is planned as a monument to the men who, with quite insufficient means and oftentimes under most unfavorable conditions, worked untiringly and with the greatest success for the improvement of the treatment of the insane. The first richly illustrated volume will probably appear in a few months; the second volume is in preparation.

While this work is meant to increase the professional pride and the eagerness for work of our successors when they look upon the example set by our predecessors, a second undertaking is destined to combat the danger which threatens the public health from excessive consumption of alcohol. The experiences of the war have palpably demonstrated how excellent an influence the scarcity of alcohol had on public health; we have to thank this scarcity for the fact that the harm done by the hunger-blockade is not even more serious. The German Psychiatric Association, in this year's annual meeting in Hamburg, dealt with the enormous decrease in cases of mental trouble occasioned by alcohol during the war, and addressed to the Government an urgent appeal for the further maintaining of this helpful change. We, too, have decided to make a careful and detailed study of all the various effects of the scarcity of alcohol in our home districts, and were very glad to meet with ready support in our endeavors on the part of several departments and individuals, more especially on the part of the departments of the Interior and of Justice. These investigations are nearly completed, and we hope to publish them in the course of this year. We made the regrettable discovery that the statistics regarding the effects of excessive alcohol consumption on the masses are most unsatisfactory. Possibly this is one of the reasons why the general public has so little precise knowledge about these questions.

Naturally the investigation of the effects of alcohol in every possible direction is one of the most important tasks of the alienist, and we were therefore greatly pleased when ample means were put at our disposal for this purpose. In the first place we plan to examine more closely the various clinical forms of mental disease caused by alcohol. Dr. Nothass has already contributed some information on this subject. Furthermore, it will be necessary to use all available means in order to explain the influence that alcohol has on the psychic state; at present several such researches are under way and are partly completed. And finally, the genealogical department has

begun to make a close study of the effect of parental alcoholism on the succeeding generations. It is a cause for great regret that the untoward times make it practically impossible to make experiments on living animals as a help toward solving such questions. Still, our Institute appears to be in a position successfully to continue its investigations of the main tendencies of alcohol research; we hope that later on we shall be able to carry on additional demographical researches. Other habitually used poisons have been investigated by us; thus Dr. Lange has made researches into the effect on the psychic state of morphium, cocaine and hyocin.

Still another disease of the masses (*Volkskrankheit*) is being subjected to a comprehensive examination. With the help of our Institute Frau Professor Dr. Senger-Rüdin has, for sometime past, been conducting it. Her task is to determine as closely as possible the physical and psychical condition, the family antecedents and the history of the development of a considerable number of children in the Munich schools for atypical children, and thus to determine the causes of degeneracy, and especially to study the effects of syphilis. Owing to the praiseworthy coöperation volunteered by a number of specialists in this examination of large numbers of pupils it has already been possible, notwithstanding the great difficulties standing in our way, to make a comprehensive collection of carefully elaborated observations. These researches are being continued in order to gain as broad a basis as possible for final conclusions.

The last field in which the Institute is endeavoring to devote its energies even though only tentatively, to the common welfare, is that of the psychology of labor. Purely scientific preparatory study which has been conducted by us for several decennia regarding the influence exerted on the efficiency of labor by certain conditions, quite naturally suggested the idea of giving industrial life the benefit of research such as has frequently been found useful in pedagogy. We therefore undertook a series of researches which seemed to us to stand in some relation to questions involved in the psychology of industrial enterprises. At the same time we sought to get in touch with industrial experts, in order to learn whether and how the research which we might be able to conduct would be important for them. We also got opened relations with the Ministry of Labor, which plans to create a federal commission for the furthering of the science of labor. Of course, we fully understand that problems of the psychology of labor cannot strictly be regarded as one of the tasks of our Institute. And we shall therefore only be able to deal with them if we receive the necessary means from third

parties. And yet, so many important problems involving the psychical and physical well-being of the masses come into play, that we would but unwillingly shirk the task of making our scientific experience and remedies available for the best employment of our peoples' capacity for work.

In taking a short retrospective view, we may say that our hopes for a rapid development of our Institute, and especially of its getting free from its present crowded state, have unfortunately not been realized, and that it is quite natural that we, too, are suffering severely from the distress prevailing in our country. On the other hand, we have been able to go on with our work in its hitherto circumscribed limits without serious interruptions, we have again and again found people ready to give us needed support, and the cooperation of our colleagues has given us welcome aid. It is especially gratifying that in our work we have gradually been able to give clearer expression to the basic thought which ought to guide our Institute: the employment of scientific knowledge and remedies in the solution of practical problems. It goes without saying that our Institute must be strictly scientific, but let us never be unmindful of the ultimate goal that its founders set themselves, namely, to serve public health and to do help in healing the severe wounds which an unkind fate has inflicted on the land of our fathers.

ANTHROPOLOGY AND INSANITY

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There is a witty French saying that "even the most beautiful of women cannot give more than she has." Even the best student of the subject which I am to approach today would not be able to give you any more than is known in those lines, and I am sorry to say there are many more gaps than there are fillings.

I shall speak on the relations of anthropology and psychiatry, or rather on anthropology in relation to the insane, and I shall divide the subject into three parts: In the first place I shall say something about the nature of anthropological investigations in relation to the insane, particularly in this country. In the second place I shall pass over briefly and imperfectly, as must be done under the circumstances, our knowledge as to insanity in the different races of mankind and in different parts of the world. And in the third place I hope to mention a few of the problems of anthropological investigation on the insane.

Anthropology can on occasion be of considerable help to psychiatry. The two branches of science are not as far distant as one might at first suppose. The conception of anthropology is often too narrow, due, I presume, largely to the fact that the anthropologist deals so much with the skeletal remains of man; often in reality he is looked upon as merely a student of the skull. This is far from being the whole truth in the case. The anthropologist studies especially the skeletal remains because these remains are most available and there are more of them; he has important cranial collections which cover all the peoples that exist, where the material may be seen and studied and re-studied at leisure. But he also studies the living, including the abnormal classes. And he measures to aid and extend his observations. You all know that visual observation has its limits, and especially so with those who are not fully experienced, and therefore you all supplement visual by instrumental observation, and you are doing that more and more as medical science progresses. And that is what the anthropologist is doing. The anthropologists are generally physicians. Only they are no more physicians of indi-

viduals—they aspire to be the physicians of the race, of humanity as a whole, and in this connection they are brought very directly into contact with all forms of abnormalities in the human family, and particularly those abnormalities that lead to insanity. If you will pardon me, I will refer to my own case as an illustration.

I did not begin as an anthropologist nor with any defined intention of becoming an anthropologist. I began as an Interne in one of the State Hospitals for the Insane in New York, but as an Interne who fortunately was able to devote his time to investigation, and it was this which led me to anthropology. In 1896 I became an associate of the State Pathological Institute for the Insane in New York City, and under the auspices of that much regretted institute attempted to organize a medico-anthropological work of large extent, the object of which was a simultaneous, extensive, detailed investigation of the insane and all the other abnormal classes in New York State. Your honored Superintendent, Dr. White, participated with about twenty-five other physicians in the State service in that investigation. The studies, which were of much promise,¹ went on for approximately two years, and there were accumulated data of much interest on many thousands of abnormals of all sorts—when suddenly it became apparent that we could make but a limited use of what we had gathered on account of not having anything with which to contrast the data, that we lacked similar data on the normal population. We had, in other words, no normal standards. Then began a feverish search for such standards on the American population and the different races represented in our institutions, but they were not found, for they did not exist. We next endeavored to make such standards—taking working men, nurses, and everybody else we could easily reach—and we began to find so many unusual things, even abnormal conditions, among these supposedly normal people that we soon saw the impossibility of getting our standards unless we examined many thousands of such individuals, which was not practicable. It was then that, in search of normal humanity, I was led to primitive people, beginning with the American Indian. There I found in a very large measure normal humanity; but unfortunately the racial differences made these more primitive men and women worthless as standards for the white people. It was at this stage that the State Pathological Institute—which had the greatest prospects of usefulness of any institution of similar nature that I have ever known to this date in this country—fell, through

¹ See *Bulletin of the State Hospitals of New York* for 1896.

political machinations, and that I was called to devote my studies to the Indian and to humankind in general. However, I have always preserved a deep interest in the field of my first work, that on the abnormal classes of our own race, and that is perhaps why I have been invited here today and why I accepted.

We may now take up the first real subject of this evening, which is the relation of race to insanity. Since when is insanity known, and how is it found in the different peoples now existing?

I wish we could go far enough into the history of man so that I could give you something tangible on the origins of insanity. As it is, we can barely go back some four or five thousand years. Yet we know that mankind has existed on this earth for at least 350,000 years. We have the actual substantiations of this fact, we have the skeletal remains. There are now in the anthropological collections of Europe remains of man who lived 300,000 years ago or over, and it is probable that even more primitive human beings existed as far back as 500,000 or a million years ago. But the parts of the early human beings that have so far been discovered are scarce, and they give no intimation as to brain pathology. As we progress toward our own time such remains become more and more frequent, but nevertheless they are still too few in number for any valid indications in this line, until the beginning of Egyptian proto history, or about 6,000 to 7,000 years ago, when for the first time they become fairly common. Among the remains of earlier man, we have not seen as yet anything that would lead us to diagnose a case of an abnormality of skull or brain. By abnormality of brain I mean, of course, such an abnormality as would have left its impress on the skull, and as might have led to some form of insanity. These skulls are very primitive, but of good size already. They are very unlike any skulls that exist today, and yet they impress one as quite normal. They are symmetrical; they do not show premature occlusions of the sutures; they do not show traces of intracranial tumor or any other abnormalities that we are able to detect. Nevertheless, I believe it would be wrong to consider insanity as of recent origin, because insanity in various forms is to be found even below the human species, in animals, and may well have existed in our precursors, particularly during the time of their rapid brain development. The time that elapsed between the first direct steps in the differentiation of some ancestral primate towards man and the earliest known human beings, was characterized most of all by the remarkable development of the brain, until it probably doubled its size and weight, and it is reason-

able to assume that during this time the species was in a state of unstable brain equilibrium which may and probably had been attended by numerous psychoses. This, together with various intoxications and head injuries, may safely be taken as an indication that some of the insanities at least, together with epilepsy, are of ancient occurrence in man.

In the pre-dynastic and dynastic Egyptian periods, physical evidence on the skulls as to possible insanity begins to appear in asymmetries, wounds, and other conditions. A large scar with an impress of the bone must surely have produced some sort of abnormal cerebration. But the indications are still rare. The insanities, as you well know, do not leave any characteristic imprint on the skull by which they could be diagnosed with certainty from the skeletal remains. We are now, however, only a step from historical records, and when these become available, whether they relate to Egypt, Babylon, Assyria, or the old Jews, we find everywhere mentions of several forms of insanity, including mania, dementia, and still others which are not always clearly recognizable. Among the Greeks and Romans insanities were already well known, and from then on references to them increase among all peoples.

Anthropological interest in the insane did not begin until the first part of the last century. Anthropology itself did not exist until well within the nineteenth century. Several decades before this, however, there arose a number of investigators of man's natural history, morphology and physiology, upon some of whom today perhaps we are inclined to look with a little askance, but who in those days, in the still almost medieval era of knowledge, were not only among the ablest students but were also perfectly sincere and did what many foremost investigators have done since—made mistakes, which, however, by their very originality and daring, gave rise to such controversies and so much further study as to advance science in definite directions. Among these investigators were particularly the early "phrenologists," such as Gall and Spurzheim. These men began with the idea, or rather with the newly learned knowledge at that time, that parts of the brain corresponded to and governed definite motor parts of the body. As knowledge was gradually enlarged the localization of the motor centers progressed, and as so often happens, some of the more advanced minds, ready to take prompt advantage of any promising discovery, took up this lead and went altogether too far by claiming and by advocating the notion that there were in the brain not merely centers for the motor func-

tions but also that there ought to be and were centers for different mental functions. And in order to substantiate their claims, they began to examine a lot of living heads of both normal and abnormal people and a lot of skulls. They became, with a few of the anatomists, the first assiduous collectors of crania. They subdivided the head and skull into many parts or areas, and each area had a definite relation to certain characteristics of the brain. By the under- or over-development of these parts or areas they judged then as to the special aptitudes and mental peculiarities of the person.

In the course of a relatively short time the fallacy of these teachings became apparent, and they passed away from the realm of science, to become the stock, as they are to this day, of fakirs. Claims of such a far reaching nature naturally roused the attention of many workers who proceeded to test them until they were found to be without foundation; and these very tests advanced science more than many a valid discovery. They originated scientific psychology, and enhanced greatly anthropometric studies, as well as the formation of for that time great collections of crania, such, for instance, as that of Morton in Philadelphia. Morton gathered almost 1,000 crania of many races, which are stored to this day in the Academy of Natural Sciences in Philadelphia, constituting one of our most valued series. And they advanced the interest in abnormal humanity, in the insane and the criminal. We must, therefore, give a due credit for their service to both anthropology and psychiatry to the early phrenologists.

In the early fifties organized scientific anthropology had its birth in France and extended rapidly into other European countries—into England, Germany, Russia, and Italy; and in the eighties the methods of anthropology began to be applied intensively to the study of criminals, insane criminals, and the insane and other abnormals. Here again the one who deserves the greatest credit in this direction is a man who has since been blamed very harshly for his errors. It was Lombroso. He wrote a number of books, beginning with the famed "L'homme criminel." They appeared edition after edition and in various translations. They were the most readable books and the most stimulating of any scientific books that ever appeared in these lines. And while subsequently it has been shown that Lombroso was entirely too confident in many respects, and assumed many things that later were proven not to be so, he has nevertheless done a vast deal of good to criminology, anthropology, psychiatry, and the study of abnormal classes in general.

Lombroso had many followers. The researches he initiated were taken up by many men in Italy, France, and other countries; they proceed in modified form to this day, and are still far from finished. Here anthropometry and psychiatry, as well as criminology, proceed hand in hand, and their association is of mutual advantage. The direct influence of the Lombroso school has of course faded. The good of these early investigations was preserved and the bad eliminated, and slowly the more modern anthropological methods are aiding everywhere in the studies of the insane, the idiot, the criminal, the epileptic, and all other sorts of abnormals.

It was in the nineties that such studies began here and there also in this country, and it was in 1896 when, I am glad to acknowledge, partly still under the influence of Lombroso, Féré, and of the European school of investigators in general, began to plan a comprehensive research on all classes of abnormals. This is the research to which I alluded before. The plans were very ambitious, and I really doubt, as I think of it soberly now in more advanced years, whether the ideals could ever have been fully realized; but I have no doubt that if the Pathological Institute had not come to such an unfortunate end, they could have been realized to an important degree. The plan was to establish as reasonably and simply as possible a generally acceptable classification of the abnormals, then to select a number of points of a physiological, pathological, and anatomical nature, and to test these points on the insane, the epileptics, the feeble-minded, and idiotic, as well as the criminals, and thus to follow as far as it would be possible. The work was begun very propitiously. I went from institution to institution, gave talks and demonstrations, and starting with one or two volunteers from the staff worked on the first group of points to be investigated. There were five blanks, a sample of which you may see here.¹ After the men were properly instructed, and the examinations were proceeding with sufficient accuracy, the investigations at that particular place were left in their hands and I proceeded to another institution. The data obtained were sent to the Pathological Institute to be elaborated, and they were to be published serially as soon as they could be prepared for that purpose.

In this manner the investigations proceeded for nearly two years, until they extended to about 11,000 insane and other abnormals. And then developed unforeseen difficulties. The first concerned the

¹ Printed Questionnaire omitted. Those interested can obtain copy from author.

men carrying on the work. This work was not of their own initiative, and hence not strictly their own. Time and again, moreover, they were burdend with their institutional duties, and an overburdened man does not take kindly to a prolonged research of such a nature as this was. He does not readily coöperate unless there are strong incentives for coöperation. These men could not be paid extra, they could not be forced to do the work, and they could not publish it in their own names. Also there were transfers and resignations. The result was a slackening of the investigations in most of the institutions. But there was another and even more serious snag which we struck. This was, as mentioned before, the lack of standards for comparison. When we had a lot of interesting and doubtless important data, we found nothing on the normal population with which to contrast them. You can readily understand that investigations on any particular class of people, unless they be contrasted with similar data on the population at large, can be of but limited significance. Finally there came the last and greatest of our misfortunes, which was the destruction of the Institute through disagreements that arose between the Commission of Lunacy and the Director. With this the whole investigation came necessarily to an end in 1899. The filled out blanks were hurriedly packed up in cases; these were removed to the Ward's Island State Hospital, and it has been impossible to find them since, so that the largest and perhaps, as far as they went, the most valuable set of data ever collected on the insane of this country has apparently been lost.

Since that time no other organized effort on a similar scale in relation to the insane and other abnormals has taken place. There were and still are carried on some individual investigations, investigations by men who had or have certain definite points in view, but nothing concerted. There is much to be learned on the insane and other abnormals with the help of anthropology and anthropological methods, but the times are evidently not propitious; the attention is centered for the present in other directions.

In European countries conditions run almost parallel so far as anthropological investigations on the insane are concerned, to those in the United States. Here and there in France, Bohemia, Germany, Sweden, England, Scotland, Italy and Russia you will find very interesting pieces of work in connection with the insane and other abnormals in which anthropological methods were used with good effect. Yet none of them are of such a scope or prospective value as those that were attempted by the ill-fated Pathological Institute

of the New York State Hospitals. They are generally the work of asylum physicians. They are the work of men who were one year here and one there, who would start a promising piece of work and seldom have a chance to finish. Nevertheless, we have learned through these men quite a good deal about insanity in different peoples, and I shall next, in a necessarily brief and imperfect way, pass over the principal of these peoples and indicate the reported conditions.

In the first place, however, when one comes to the question of any disease in separate peoples or races, it is important that the student should have a fairly clear conception of what these subdivisions of mankind really mean or represent.

There are recognized today three great races in the world. These are the Whites, which run from blond in northwestern Europe to almost black in India and Abyssinia; the Yellow-browns, which comprise a large part of the Asiatic people, a large part of the people of Oceania and the native American Indians; and then the Blacks, which involve three or four types—one the tall African negro; second, the small type of African negro; third, the Negrito; and fourth, the Papuan and Melanesian. There are also the Australians, who, however, are looked upon today as mixed people. These are the principal races, and they all have their sub-types or races in the narrower sense of the word, which differ in many respects. None of these subdivisions can be regarded as different species—they may be compared to the varieties of the different domesticated animals. This is important for psychiatry and every other branch of science dealing with the various groups of mankind, for as long as we do not have as much difference between these groups as exists between species and species of animals, we can hardly expect any very radical differences in their mental make-up and their psychiatric manifestations.

Yet it has been found that different peoples do differ quite markedly in some at least of the insanities. It has also been found that in course of time and contact of the different races, and especially as a result of marked changes of habits, conditions relating to insanity have in some instances changed very perceptibly. In most cases, unfortunately, the change has been decidedly for the worse rather than for the better.

In the first place, we may take the Australians. If you will take the trouble to look up the literature of the early physicians in Australia, during the period of the earliest contact with the natives, you

will see that they point out without exception the almost non-existence of insanities,—but they also point to a number of curious conditions which make it plain why insanities were so infrequent. In the first place, the native life of the Australians was one of but little mental stress. The country was never overpopulated, except perhaps in a limited number of localities; there was no great struggle for existence, although there may have been occasional famines; and there was no great striving in any direction. The Australians lived largely a higher animal sort of existence, which did not call for any great exertion on the part of the brain and nervous system. In addition to that, the rare cases of insanity that happened among them were dealt with in accordance with the crude views of men of such a primitive state of culture. The excited cases, the maniacs, or what corresponded to our maniacs, are said to have been regarded as possessed of bad spirits and as such were done away with. The melancholic, or rather the depressed—for it is a question whether melancholia as we know it existed among such people—were allowed to do away with themselves, as you know they often do anywhere when left to themselves. The occasional epileptics in severe cases were driven away from their groups, and probably succumbed in a short time under such conditions. Here you have a remarkable primitive sort of way of eliminating the undesirable portions of the race. Also there was no alcohol, there were no addicts to drugs, and there were, so far as recorded, no addicts to other practices which would have tended to cause mental diseases. These conditions became radically changed upon the advent of the whites. The white man introduced destructive diseases which did not exist in Australia before, especially syphilis. He admixed the Australian and introduced not only his own hereditary weaknesses, but possibly also disharmonies, which in cases had unfavorable effect upon mentality. He introduced alcohol and otherwise affected the native unfavorably. Through all these adverse influences, the later medical men in touch with the natives claim, insanity now has become twice as frequent in the native Australian as it is in the native whites of Australia. It is certainly much more frequent than it used to be.

Incidentally to this, there are certain observations on the nature of the insanities that are not observed in the Australians. In the first place, although syphilis has become common, general paresis and tabes are still very rare, if they exist at all in the natives; some of the authors claim outright that they do not exist. In the second place, there is nothing that would correspond to white man's para-

noia, and no such cases as would correspond to the typical cases of acute mania or acute melancholia. The most common mental disorders among these people are manic-depressive states, then the amments and the dementis. Dementia praecox is quite common, and is more frequent among the natives now than among the Australian whites without any doubt. Forms of insanity which would manifest themselves in abstract cerebration, in any great imagination, do not exist. So it is plain that there are some marked differences between the insanities of the Australians as they exist today and the insanity of the whites, differences due, on one hand, to different degrees of development of the central nervous system, and, on the other, to varied immunities or predispositions in the two races.

As to the real negro—of the African negro we know as yet very little in these respects. What is known is that occasionally an old negro in Africa, in the wild state, becomes demented. It is also known that epilepsy exists among them and does not even seem to be very scarce. It is further known that a form of mania and a form of depression happens occasionally, and that dementia praecox is not infrequent; but that is about the limit of our data. As to the negro in America, that is another story to which I am going to refer a little later.

The yellow-brown people are very interesting and, curiously enough, they do not behave entirely uniformly in their manifestations as far as mental troubles are concerned. Here again, very strangely, the larger part by far of the yellow-brown race, including the Americans, is very largely free from general paresis. In some places, and in very large districts such as the interior of China, general paresis is a very rare manifestation, and when it does manifest itself it is of subdued form—it is not characterized by grandiose ideas and the actions that we so commonly meet in the disease in the white man. And with general paresis comes a great scarcity of tabes—locomotor ataxia. Yet in all these countries syphilis is common. Many of the local physicians, and there were good observers among them, tried to penetrate the mystery and come to some conclusion as to why syphilis, which is so common in certain parts of China, should not produce general paresis. The only conclusion they reached, and even that but tentatively, was that general paresis and tabes are syphilis plus some unknown quantity, and that this unknown quantity is possibly absent in these Eastern people. A curious condition was observed in this connection in certain of the ports of China. There is a little hospital in Canton under white

man's control. In this hospital syphilitic patients from all parts of China scarcely ever develop a case of either paresis or tabes. But the Chinese mariners who got their syphilitic infection outside of China, especially in a white man's country, showed a larger proportion of tabes and paresis than all the other syphilitic patients in the hospital, which included also white men. Here is something which is well worth further investigation and which one may hope will not only throw a desirable ray of light on our conception of the nature of the disease, but also give a clue as to its prevention and treatment. In Japan, where there are many seafaring people, both tabes and general paresis are fairly common as in white men, and it appears also that general paresis in the Japanese runs the usual course to which we are accustomed.

Another difference of the yellow-browns from the whites in relation to insanity, and very much the same as has been observed in Australia, is the rarity of typical high-class paranoia. There are stages or conditions where the syndrome of paranoia is present, but those cases when observed by experienced white physicians seem to be imperfect, or "off color" if one may use such words; they do not fully reproduce the typical picture of paranoia as known to us. But the yellow-browns give also, like most and probably all of the colored races, a relatively large frequency of dementia praecox, and in the second place a frequency of the maniac depressives. But there is a scarcity again of the pronounced melancholias and pronounced manias. It is plain that between the Oceanians and the yellow-brown people there are many resemblances in these respects, although the Australians etc. and the yellow-brown race have little, if anything in common as to their recent derivation.

We have considerable data on insanities from India, from Burma, from Siam, from Ceylon and from practically all the rest of the British, French and Dutch possessions in the Indian Ocean, and all these reports—into the details of which we cannot enter—show more or less difference between the conditions as observed among these peoples and those we know among the whites. With some exceptions in India, the insanities in general do not seem to be so violent, so extreme, so fatal. A good many of the patients after a longer or shorter time in an institution are able to be sent back into the maelstrom of the population, and they make their living and keep on existing without further serious trouble; but recurrences are not infrequent. There seems not to be much difference in the frequency of insanity between Europe and India, which may be due in

some measure to the large Aryan infusion in India. There occur however, certain insanities that are not observed in Europe, such as that induced by an excessive use of hashish; and a little farther east there is evidently a form of insanity due to the abuse of opium. But in all these countries alcoholic insanities are practically negligible, and the absence of alcoholism serves to modify the frequency and nature of some of the psychoses.

In Polynesia there is a form of mental trouble which does not occur among the whites or even in other parts of Asia; it is the leprotic psychosis-insanity, connected with and according to all indications directly caused by leprosy. This psychosis is occasionally observed in Japan, but it is especially common among the Hawaiians and other Polynesians.

There is a peculiar form of insanity in the Far East which follows pellagra. Pellagra is relatively frequent in Japan and other countries of Asia. It does not seem to be followed by as fatal mental trouble as with us, but there is more of this form of psychosis.

Finally there is a form of insanity in the far southeast which thus far no one has been able exactly to define or to learn the pathology of, and that is the so-called "running amuck." It seems specially common among the Malays, and is almost restricted to the yellow-brown race. You all know the symptoms of the outburst, which is always indiscriminately homicidal. It is generally followed by the killing of the killer, in fact, the native population when they get hold of him chop or break him to pieces, so that further progress of the condition can not be observed.

So much for the Oceanic and Asiatic countries. As to the white race, it only needs to be said here that the different branches of the white race, while in general much alike in relation to the insanities, present nevertheless local, group, differences in the frequency, strength and nature of these abnormal mental manifestations. Take Russia for instance. A series of observations made many years ago along the Baltic coast and in southwestern Russia, and giving information on the Ukrainians, the Germans settled in the Baltic provinces, the great Russians and the Jews, shows very interesting differences in the relative frequency of the different forms of insanity in these various peoples. Similar observations have been made also on various nationalistic groups in other parts of Europe and they show again differences for which sometimes there seems to be a reason, but for which at other times there is no apparent explanation except perhaps that they are based on somewhat different heredity. Take,

for instance, the case of Ireland—the insanities in Ireland are reported to be in general more frequent than they are in England or Scotland. Why this should be so is not clear. The Irish people are a mixed group, and the elements of the mixture are more like those of the English people than is usually imagined—yet there are rather marked differences both in the normal behavior of the two groups and in the abnormal. In Massachusetts, where Swift made some interesting studies on insanity in different racial groups, he finds that the Irish lead in the frequency of the insane, and that they lead especially in alcoholic insanity. Alcohol may however frequently be considered as merely the final agent, which arouses and perhaps intensifies a thing that may or may not have developed into a form of insanity without it. Whatever the causes may be however, the frequency of insanity in the Irish seems to be well attested and is well worthy of attention and further investigation.

Another interesting lot of white people about whom a great deal has been written in regard to insanity, are the Jews. Here unfortunately, much depends on who writes about the Jews, if it is a Jew or a non-Jew. Authors of the same stock try, naturally, to make conditions seem as good as possible, while some at least of the non-Jewish writers have plainly been biased sometimes in the other way. The truth no doubt lies somewhere between the two. What is generally admitted is, that alcoholic insanities—all forms from the lightest to delirium tremens—are less frequent in the Jews than in any other white people on whom there are statistics. On the other hand, dementia praecox, depressions and still other psychoses, appear to be more frequent with Jews than in the native Americans. Here again are interesting conditions, the exact extent, nature and causes of which remain for determination.

There is a very interesting lot of people on this continent outside of the whites of whom a few words may be said in this connection. They are the Indians. The speaker has a considerable experience among these, in which some attention has been paid to the occurrence and nature of insanity, and there are also observations of others. More than this, there are now available the figures of the Government Hospital for the Indian Insane in South Dakota for the last eighteen years. In the United States we have approximately 300,000 Indians. Of this number about 250,000, more or less, are contributing insane to the just-named hospital. The rest are in Alaska or are scattered in regions where they cannot reach or be reached by this institution. Out of these 250,000 Indians there have

been received in the Indian Hospital in eighteen years, 239 patients, and 38 were last June on the waiting list, making together 277 cases. Moreover out of those 277 cases in eighteen years about forty per cent were epilepsies or connected with that disease, leaving only about 166 cases of other psychoses. This tends to indicate a much smaller incidence of insanities in the United States Indians than in any other of our peoples; and this corresponds entirely with my individual observations among both our own and Mexican Indians.

To test the matter still further we may take the Census records of all the insane hospitals in the United States. Some Indians will get into these institutions even though the Government tries to get them in the Indian Hospital. The 1910 Census records show that in all the hospitals for the insane in the United States, the Indian Hospital included, the total number of admissions of Indians and Indian mixed breeds was three times lower than the admissions of the whites in relation to the population; and here again there are included the epilepsies which really should be dealt with separately.

And there is still another criterium. The Indian Insane Asylum is located in the vicinity of one of the greatest of our tribes, namely the Sioux, and from this tribe, which is far from other institutions for insane, the hospital has doubtless secured the full or nearly full quota; nevertheless the proportion of the Sioux insane in that hospital is very much smaller than that of any white people in any of the States or countries of which we have any knowledge in this direction.

Besides the scarcity of insanity in general among the Indians, we find interesting differences in variety. Paranoia is practically absent. In all the eighteen years in the Indian Hospital for the Insane there was but one case diagnosed as paranoia and that was not typical. There is, too, a scarcity of general paresis. There are but four cases recorded in eighteen years, and they apparently differed from the classical cases among the whites, though like those ending fatally.

The bulk of the cases again, as we have seen in Asia, is dementia praecox, manic-depressive cases, and dementias, which latter doubtless include also idiocy and imbecility.

Why should the Indian who to-day is subjected to quite a good deal of stress and to all sorts of introduced diseases, show so much less insanity than the white man and such differences in the psychoses that he does develop, is another fruitful field for investigation.

An even more important racial group than the Indian in the United States is the negro with his admixtures. The subject of insanities in our colored population demands alone a very comprehen-

sive inquiry. The United States Census reports of 1910 give us the information that insanity in general is less common among the negroes in the southern States than among the whites of the same territory, but that the conditions are reversed when we come to the large cities of the north. Also there are differences in the kind of psychoses which affect the negro from those that are shown by the whites, and there must be differences as to frequency and possibly also in kind between the full-bloods and mixed-bloods. The whole subject calls for a thorough scientific investigation.

The above constitutes of necessity the bulk of my presentation to you tonight. All I wish to say in conclusion is to point out a few additional lines of very promising and needed research—research in which anthropology is ready to help to the limit of its possibilities.

The foremost of the subjects in this country which deserves a careful and unbiased investigation is the question of the frequency and nature of the insanities brought into this country by the immigrant. You will see time and again a loose statement that from this particular standpoint, besides others, the immigrant is a detriment rather than an asset. You will find data from reliable students of the question and even from hospital records which will tend to show how much larger percentage of insanities occurs among the immigrants, especially certain classes and nationalities, than among native Americans. But there are many things these observers do not usually take into account. In the first place they compare the number of insane of the immigrant population with that of the native Americans without due discrimination. The native population is a group of families with the majority of individuals children to adolescents, while the immigrant is very largely constituted of adults. There are immigrant children, but the number of adults is more or less out of proportion to these according to the group of immigrants. Now it is not the children as a rule who enter the insane classes unless we include imbecility. The immigrant adults should be compared with native adults, and that adults of similar age and social classes. Until that is done we shall not be able to know just how much the immigrant is a detriment in this particular direction.

Another line of psychiatric research that is decidedly promising for the future is that on the abnormal child. Certain good beginnings have already been made in this country as well as abroad, and yet to this day there are many uncertainties. It is still hard in many cases safely to diagnose the abnormal child, and still harder to gauge

its future or determine upon the most rational treatment. I should advocate, and hope to see, a coöperative investigation of all children suspected of mental abnormality by the psychologists, the anthropologists and the psychiatrist; and I should advocate, and hope to see a regular study of such a nature on all our abnormal classes, not merely children.

There are also many interesting side-lines of psychiatric investigation. It is known, for instance, that the proportion of certain forms of insanity differs in the cities and the country and the causes of this are by no means as yet clearly determined. Why should the country people be more liable to insanity than the great-city people who are so much more subject to all sorts of mental strains? There are also the people of the mountains and the people of the lowlands with indications of at least some difference in relation to the insanities, which one day will be worth while looking into. In this country we have also different, what one might call "super-imposed", strata of population. We have the native, born here yesterday; the native American of one, two, three and four generations, and then the oldest families. Recent studies in anthropology have shown that the American of three or more generations differs perceptibly in physiognomy and otherwise physically as well as in function from the newer elements in this country; and it is reasonable to expect that he differs also in relation to psychiatry. At all events the facts here also remain to be determined.

We then have the question of pigmentation in relation to insanity. The problem has been nicely studied in Scotland by Tocher. He finds that the blond element among the mentally abnormal predominates unduly over the dark, and something similar has been indicated by investigations elsewhere. It would seem especially that in countries where the blonds are not strictly at home they tend to suffer more physically as well as in mental stability. The truth is still to be established in this connection.

I could go on and mention still other lines of practical investigations which await you. As you all know, there is still plenty to be done in the line of occupational effects, of the effects of various mixtures of blood and of still other agencies in relation to insanity. In these subjects it is my strong conviction that in the future psychiatry may and will be benefited by anthropological methods and coöperation: and I trust you will make due use of Anthropology.

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SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

396TH REGULAR MEETING, APRIL 4, 1922

DR. FOSTER KENNEDY presided

PATHOLOGICAL FINDINGS IN THE HEART IN PROGRESSIVE MUSCULAR DYSTROPHY

JOSEPH H. GLOBUS, NEW YORK CITY

Some years ago I had the opportunity to observe the pathology of the heart in a small number of cases of progressive muscular dystrophy. My attention was drawn to one feature, particularly in two cases: viz., after a long period of *status quo* there suddenly developed a sequence of events which ended fatally. The patients were fairly well, when without warning, there suddenly appeared pulmonary edema, hydrothorax, hydropericardium, with death in twenty-four hours after onset of symptoms.

The opinion expressed for several years has been that death in these cases of progressive muscular dystrophy is due to paralysis of the diaphragm. I believe that in some cases there is another cause operative, namely cardiovascular disturbance.

On studying the heart very carefully anatomically, I found definite changes in the heart muscle, not differing in any way from those in the skeletal muscle. One case was not sufficient to base definite conclusions, and another case was waited for and careful examination made. Lesions were again found which correspond to changes in the skeletal muscle. Dr. Goodhart and I reported this case, but did not sufficiently stress the cardiac lesions. Later another case was examined and well-defined changes were found.

In the literature two types of observations are recorded. Oppenheim in 1911 recorded these lesions as a disease of the central nervous system, but many other workers have interpreted them as myopathic in character. Oppenheim does not feel that the heart is affected similarly to the skeletal muscle, while other workers take the opposite view. Thus two viewpoints are reported: those that record clinical observations without anatomical findings; and *vice versa*.

Among the clinical reports were those of enlargement of the heart, irregularity, and increase of rate and intensity of the heart beat, palpitation on exertion.

On going through the literature I find only eleven cases reported since 1879 in which the hearts were studied. Eight of these recorded definite myocardial lesions, in no way differing from changes found in the skeletal muscle. The other three cases were not so definitely

grouped. There were changes, however, in color, consistency and invasion of the subepicardial fat.

I will report the findings of a boy with progressive muscular dystrophy, ten years of age, who died twenty-four hours after the extraction of a tooth. On autopsy, the muscles were found infiltrated with fat, including the diaphragm. No excess of fluid was found in the thorax. Several small pneumatic areas were found in the lower lobes of the lungs which were edematous.

The heart, pale yellowish red, was flabby and friable. On section, the wall of the left ventricle showed many translucent patches, irregularly distributed, apparently areas of fibrosis which bore no relation to the blood vessels. The thymus was large, solid, and rich in lymphoid tissue. The liver showed marked fatty infiltration.

Microscopically, the heart showed many connective tissue scars. Individual heart muscle fibers were seen in various forms of degeneration surrounded by massive bundles of connective tissue. Fat was found in the connective tissue and about the blood vessels. Many small round cells were seen, interpreted as a reactive phenomenon to the degenerative changes nearby. The muscle fiber changes were edema with swelling or atrophy, hyalinization and fragmentation.

In the thymus were a large number of vessels, some almost completely occluded by proliferation of endothelium.

(Lantern slides were used to demonstrate the various pathological conditions found microscopically in the heart, thymus and skeletal muscles.)

Conclusions: The heart does not escape myopathic processes in progressive muscular dystrophy.

The changes are milder in degree than those in the skeletal musculature. The changes would be more frequently found if the heart were studied more systematically during life, as well as anatomically after death. The heart plays an important rôle in causing death in progressive muscular dystrophy.

DISCUSSION

DR. WALTER TIMME said: I think what Dr. Globus has told us to-night emphasizes the protean character of the disease and its involvement of practically every organ, but not necessarily in every case. You will find cases in which there is marked myocarditis demonstrable in life, and many cases in which it is not demonstrable until after death. I have seen a case of a man eighty-two years, who had the disease since infancy. He was a preacher and had to be carried to the pulpit. He had no sign of myocardial disease. The dystrophy manifested itself in fourteen descendants in three generations, but in none of them was there myocardial disturbance. It is a slowly progressive disease in the milder forms, and in these there is no myocardial disturbance. Another form of the disease, as described by Gowers, in which death occurred early, from the sixteenth to the nineteenth year, there is usually a cardiac condition and one in which fatty degeneration assumes marked proportions. I think we have got to look upon this disease not exclusively as a muscular one. It is not a pure myopathy, but the myopathies which

occur are the most outstanding feature. Other atrophies, other dystrophies are seen, but not universally seen. You may have progressive muscular dystrophies with only slight muscle changes. But at autopsy you will find disturbances in the anterior horn cells and in Clarke's column, in the anterior gray substance, in Lissauer's zone, which are not at all correlated to the slight muscular disturbance. In other cases at autopsy there are no spinal cord changes, but there have been marked muscular dystrophies. So far as changes in the thymus go, that is very interesting. I radiograph all my cases for thymus, and a very large proportion of cases have persistent thymus and certain cases in early life show a pineal shadow. Marburg has published a paper on early pineal disturbance, accompanied by abnormal fat deposits about the body. I think we are coming more and more to see this disease as one in which the degenerative process is dependent upon deficiency disturbances, probably in the control of some one or other or a group of the internal glandular units. Dr. Globus has made a splendid presentation and I wish to thank him.

DR. FOSTER KENNEDY said: Dr. Globus stated that a certain number of the cases studied died from a water-logging of the chest. I think it would be interesting to know if the case examined by him had such a death: I saw a similar case, a child thirteen years old, who died at nineteen, with pseudodiaphragmatic paralysis. This child suffered acute cardiac dilatation for some three weeks before death. She had hydrothorax, which as Dr. Globus said, sometimes occurs. The acute cardiac dilatation was not the primary lesion, but consequent upon the overstrain upon the heart. That view of the situation may have been entirely mistaken. Perhaps Dr. Globus will comment upon that view.

DR. GLOBUS said: I agree with Dr. Timme's suggestion that the disease of progressive muscular dystrophy is a more generalized pathological condition than we are apt to consider. Bunting found definite lesions in the musculature of the gastrointestinal tract, typical of the lesions found in the skeletal muscle. In one case that came to autopsy, I have found marked fatty infiltration in the liver, with no other pathological changes in the organ. The fatty infiltration was diffuse and bore no definite relation to the vascular or hepatic system of vessels and ducts. There was no inflammatory lesion or degenerative process, but some dystrophic change. The same worker reported changes in the musculature of the large blood vessels. The changes in the liver point to a more generalized pathological condition in progressive muscular dystrophy. I noted hydrothorax and hydropericardium in three cases. The finding of excessive fluid in the pleural and the pericardial cavities led me to the study of the heart muscle. The excess in pericardial and pleural fluids is best explained by the changes in the heart muscle. Dr. Kennedy adds one more to the limited number of cases studied.

DR. FOSTER KENNEDY (continuing) said: It has been said to be common to have marked changes in the spinal cord. I feel inclined to differ from this viewpoint. My experience has been that changes in the anterior horn and Clarke's column were not common. I do not think it is common in the literature. The neural changes occurring

in paralysis are identical with those occurring after amputation, brought about by disuse. I think the changes in the spinal cord are secondary to those in the muscle. If we are to consider this as primarily an anterior horn lesion, and a minor muscular disease, we become extraordinarily fogged in our classification of the pathology. I would like to ask the other men for some expression of opinion as to Dr. Timme's viewpoint. His experience has not been mine. I should like to discuss that point.

DR. WALTER TIMME said: Three cases were reported by Kollarits and two by Schultz. These autopsy findings showed changes in the anterior horn cells in some cases, but not comparable to those in poliomyelitis. The cells are simply smaller than normal, not degenerated. There was some disturbance of the fibers of the anterior cord substance. There were smaller cells in Clarke's column than normal. These findings are not universal. In cases of widespread muscular dystrophy there was not widespread diminution of the cells—often very few small cells. There was no concordance of the two conditions. They appeared to be absolutely independent of each other. It seemed to be a general atrophic condition involving the cord cells, as part of the general process and not secondary.

DR. GLOBUS (in closing) said: Modern neuropathologists have two types of lesions to account for: degeneration and inflammatory conditions. Poliomyelitis is an example of a purely inflammatory lesion. It may have secondary degenerative processes. The primary inflammatory process is characterized, as is well known, mainly by perivascular infiltration, as in any inflammation. You certainly can't think of the cord changes in progressive muscular dystrophy as inflammatory. Are they to be considered as degenerative? Every degeneration in the central nervous system is accompanied by changes in the blood vessels and in immediate vicinity. The modern pathologist in such instances need not study the parenchyma; he studies mainly the functions and relations of the glial elements. In degenerative lesions of the central nervous system one must find cells carrying away the products of destruction in the cord. The modification in size or shape of a nerve cell is not necessarily a pathological phenomenon—it may be due to technical errors in preparation of material for study. But the glial reaction, its accumulation of gitter cells, and other phagocytic cells in the adventitial spaces is evidence of a degenerative process. Such changes are not encountered in the spinal cords of progressive muscular dystrophy.

A NEUROPSYCHIATRIC PILGRIMAGE

DR. SMITH ELY JELLIFFE, NEW YORK CITY

DR. JELLIFFE said: As I hope to bring to you this evening some observations of personalities and of conditions concerning the work going on in Europe in neuropsychiatry following the war, I hope to be able to avoid that criticism once expressed by one of delicate sensibilities who, on observing a certain prima donna, remarked "There were too little clothes and too much Mary." So if in my narrative of my pilgrimage to the intellectual shrines of Europe there is too little shrine and too much Jelliffe, I feel assured I have

at least crossed my fingers by notifying you of the possibilities of the situation.

In medicolegal parlance it is customary, however, for the expert to qualify and though in this audience I feel certain that opposing counsel will grant my qualifications, yet one's "too much Mary" would regret leaving the stage without saying who she was.

In 1890-1891, a year after my graduation in medicine, I made my first European pilgrimage. It was a student's *Wanderjahre*, a year filled with planting, the harvests from which are still ripening. I may later speak of certain comparisons of that thirty years ago student year, spent in Vienna, Berlin, Paris and London. Ten long, good years of grind went by before my next trip—this practically was confined to Norway, Sweden, Denmark and the Hanseatic towns. Since that year, however, 1900 and the year 1910-1911, when I spent another complete year in Berlin and Paris—I had visited Europe, neurologically speaking, five times. In these ten years I had visited now one, now another neurological or psychiatric shrine. In one we did the asylums of Belgium and of Northern France. In another, this time with Drs. White and Gregory, we explored the psychiatric clinics of Italy from Milan to Naples, after we had gone through a semester with Kraepelin in Munich. Though this was in 1904, seventeen years ago, I can still vividly recall the asylum in Rome just under the shadows of St. Peter's, where in two wards at least eighty patients were strapped to their beds. Such an uproar! Bedlam of the Middle Ages must have had a thriving business, for as you know it was a custom in those days to issue tickets of admission at a shilling a head, six pence for children, and show them the animals. This superstitious awe, and fear, born of folklore tradition concerning the mentally sick, is too widespread even at the present day.

But I must hasten. My last visit to Europe had been in 1914 just before the war. This was short and was chiefly confined to the castles of the Loire; of medicine there was little, of architecture and romance much. Still the new Pitié Hospital was just going up and Babinski's new clinic outlined, and the nurses' training school at the Salpêtrière just being erected. At last, I said to myself, France has commenced to modernize its old buildings. And then came the war. In June of 1914, the wistarias of Aizy le Rideau were never more lovely, and the quiet waters of the Cher flowed under the chateau of Chenonceaux without a murmur of the gathering storm, and no whisper of the future came to my ears in Paris as I left for America in July of that eventful year.

In May of 1921, seven years later, it was vouchsafed to me the privilege of visiting many of my old haunts and to attempt to pick up the threads that had been so rudely broken. Some never could be resumed. Fortunately new ones might be taken up, and so I shall try to bring before your eyes some of the well-known faces, no more to be seen—many others; still actively working in the branch of medicine, the common interest in which brings us here, and certain suggestive notions that lay along my roadway. Come travel with me in imagination and bear with my desultory remarks. In so far

as I feel that we are *en famille*, I am certain that if certain gossip be uttered you will all forget it.

I cannot go over the entire list of the losses of French neurological science during the war period, which in general is covered between 1914 and 1921, but certain very important gaps have been made. France lost at least three of its greatest men. Its sister state, Belgium, also suffered an irreparable loss. They were all older men and had each done his life work. Each stood preëminent in his sphere. Dejerine was perhaps the greatest figure of them all. I regarded him as my chief as I worked patiently with his "Anatomie" for six months in 1910 endeavoring to make good the inroads on a memory made rusty by too steady and prolonged an application to the business of bread and butter getting and nest building, and when I came to my salad period it was a delight to turn to Dejerine and Madame Dejerine to make good, if possible, these losses. I need not remind this audience what Dejerine means to neurological science. His early "Familie Neuropathique," his "Familial Myopathy"—these are milestones in neurological progress. With Thomas, his "Maladies de la Moelle," his classic, the "Anatomie," in conjunction with Mme. Dejerine, and his final large volume on "Semiologie"—these are but a few of his standard performances which have enriched neurological science. I would like to speak of his personal charm, his bonhomie, his rare skill and tact in handling the neurotic patients according to his view of their disturbed emotional situations, and my own modest effort in aiding the march of psychotherapeutic progress in America through my translation of his work on psychotherapy, I mention as "a part of Mary."

I shall return to Dejerine and more particularly to Mme. Dejerine and their pupils in a moment, for I must allude to another lost leader—this time a native of Bordeaux, who has been one of the dominating figures in French psychiatry for many years—Régis. His name is familiar to many of the older men in psychiatry, as it will be recalled his work on mental diseases was translated and published in Utica by the New York State's Hospital Press. He was a fearless and strong man. I can recall a most interesting meeting with him at Nantes. He was one of the first to be interested in psychoanalysis, and with his pupil, and now his successor, Hesnard, in Bordeaux, gave us their well-known criticism of the Freudian principles. To our way of thinking this is quite academic and a criticism of words and definitions and not founded on actual experience. In a three hour conversation with Hesnard at the Grand Hotel in Paris last June I learned that neither Régis nor Hesnard had really analyzed a single patient at the time the book was written.

In the early years of the war the death of Van Gehuchten made all of us, who had known this gentle soul, mourn. His life work in Louvain had been destroyed in that mad rush of war and he himself could not survive it. We can recall the generous help that sprang from Oxford to endeavor to give him something to live for. But the blow was too deep. He could not survive an appendix operation. One can read through this attack of appendicitis and its fatal

termination much more than a mere surgical case report. But of this we cannot stop to inquire.

Our next immortal, Grasset, I first met in Montpellier many years ago. He showed me the red gown of Rabelais and the relics still guarded there at the University. He was a very remarkable neurologist and the younger men here may profit from Grasset and Rauzier's *Traité de Neurologie*, a big fat book, crowded with data and quite the equal in many respects of Oppenheim's classic.

Having paid but short respects to the dead let us return to the primary object of my visit, namely, the annual reunion of the Paris Neurological Society—1920 had seen the first general reassemblage of that body since 1914.

This leads our steps to that great Mecca of French neurology, the "Salpêtrière." Here at its gray and imposing portals, through which a constant stream is pouring, we see the statue of the immortal Charcot; we pass through; we notice court after court, made by the intersection of many three-story gray stone edifices. This, I may tell the uninitiated, is practically a city poorhouse for indigent and invalidated women and it has its counterpart for men in the "Bicêtre," lying in a different part of the city. But it is more than just a poorhouse, it is in reality an enormous storehouse of a great variety of human ills. Here for many generations neurology and psychiatry have drunk deep of knowledge, reaching an acme in the genius of Charcot, towards whose clinic I would first direct your attention. It was here that he worked. Raymond, his successor, carried on, feebly perhaps, in view of his predecessor's brilliancy—and whose election is reputed to have been the cause of so bitter a disappointment to the brilliant Dejerine that he had a severe depression and retired to the Bernese Oberland where Dubois' sympathy and insight worked a cure and Dejerine carried on, brilliantly, and finally reached the acme of his ambition. At his death in 1918, Pierre Marie followed him and it is to his courtesy I am able to show you an intimate glimpse of the Charcot library and collections housed in the building in which the clinical work is carried on.

Dr. Jelliffe here showed lantern slides of Dejerine, Régis, Grasset, Van Gehuchten, and of the Salpêtrière, showing the following views: Main gate; Charcot monument; Charcot clinic building; Charcot pathological laboratory; private examination room; portrait; Charcot library; infirmary; Dejerine, psychotherapy.

He then spoke of Pierre Marie, the present professor of neurology, of his facile and intelligent interest in all things neurological, especially in his quick vision to grasp the significance of small variations in structure and function. Dr. Jelliffe spoke of his great courtesy to American students, the first occasion for observing which he had had a number of years previously while Marie was at the Bicêtre. The enthusiasm that he could arouse among his students made him the present most dominant figure in French neurology.

Dr. Jelliffe then turned to the second reunion of the Paris Neurological Society, showing a lantern slide of the members present, pointing out a number of the foreign delegates, Wertheim Salomonson of Amsterdam, K. Petren of Lund, A. Wimmer of Copenhagen,

V. Christiansen of Christiania, C. Negro of Turin, and a number of others. He then spoke of Dupré whose death has just been announced and then of Claude, who had just been elected to take Dupré's chair of psychiatry at St. Anne—a clinic made memorable by Magnan and many illustrious predecessors and followers.

The nomination of Claude to the chair of mental medicine of the University of Paris is one that has met with considerable approval by his colleagues and confrères. It seemed that he was destined for neurology, as Raymond's interne, but he turned aside as winner of the gold medal internship to internal medicine and for ten years served as preparer for Bouchard in the pathological laboratory. Here he laid the foundations for his knowledge of general pathology, of experimental medicine and of general medicine. In the field of neurology he has gathered ample harvests. In psychiatry itself as more sharply delineated it cannot be said that Claude has made as yet any striking contribution to this field but the solid foundations on which he has reared his knowledge of the action of human beings leaves little doubt that in this field he has much to contribute.

Henri Claude was made interne of the hospitals during the year 1893, interne of the gold medal in 1896, doctor of the hospitals in 1901, fellow (agregé) in neurology in 1903, assistant at the Clinic of Nervous Diseases and under this title was frequently in charge of the course at the Salpêtrière where he directed the service for the nonresident psychopathic patients.

Frequently laureate of the Faculty of Medicine, of the Academy of Medicine, of the Academy of Sciences, he is a member of the Society of Biology, a member of the Society of Psychiatry, of the Society of Legal Medicine, of the Society of Neurology of which he has been president. For the last fifteen years he has been expert of the tribunals where association with him is particularly appreciated by both judges and physicians.

He has published a number of studies in the important review "L'Encephale" of which he is one of the directors. It would be unjust to forget the services which he rendered to the country during the war as chief of neuropsychiatric centers of the greatest importance and a director of commissions. It is an impossible task to attempt to give an exact idea of Henri Claude's works in the limited space of this talk. His publications touch upon the broader problems of medicine, of neuropsychiatry, of endocrinology, and of experimental pathology.

His studies on the pluriglandular syndromes, on the method of glandular tests, on the relations of glands of internal secretion to disorders of the nervous system are known to most present. His book upon the semiology of the divisions of the peripheral nerves, enriched with valuable personal documents, was very useful in the study of the innumerable injuries of the nerves due to the war.

Serous Meningitis and the Syndrome of Intracranial Hypertension constitute some of his most important works in neurology. One should add here his researches in cerebral tumors, in epidemic encephalitis, in atrophy of the cerebellum, in tumors of the protuberance, in spinal disorders, sections of the spinal cord, etc.

In psychiatry, his studies, his reports at conferences on epilepsy, the nature of hysteria, the rôle of the emotions in the psychoneuroses, apraxia, mental disturbances in epidemic encephalitis, dementia praecox and senile dementia made him an authority.

If the moment has come when psychiatry is able to comprehend anything else than the subtle classifications remaining from generation to generation, if, following the dream of the psychiatrists of the front rank, it can perhaps be impregnated by the ideas of internal pathology, of general pathology, of neurology, of endocrinology, then this is the place to hope that Henri Claude, aided by the disciples he has already made and by those who shall desire to attach themselves to his school, will contribute powerfully to the renovation of this science, entering more and more into the path of biological research.

Taking up the work of the Congress itself, Dr. Jelliffe spoke of the method adopted by the French congresses, differing as it does so materially from methods followed in this country, in England and in Germany.

He briefly went over the main theses reported by Souques.

Paralysis agitans, or Parkinson's disease, is not a morbid entity. It is not a disease *per se*. Souques would envisage under this title a syndrome which may result from a number of different causes which act upon a certain localized portion of the nervous system. It is not the nature of the cause, nor the variety of the lesion which should occupy the major focus of attention, but rather the study of the topography of the structures involved. The others naturally are of interest but in order to have the important concept in mind, the facts of anatomical locality are the important topics. Certain modifications of the clinical picture are accompaniments of certain specific causative factors but these are of secondary value in regarding the concept.

Whereas the clinical history of paralysis agitans, or the Parkinsonian syndrome has had great elucidation, it cannot be said that its physioanatomic comprehension has kept pace with the clinical descriptions. The object of his report was to bring together all of the newer conceptions in which the work of the Dejerines, the Vogts, Kinnier Wilson and Ramsay Hunt were daily emphasized—Edinger's and Kappers' term adopted by Hunt of the paleostriatum for the globus pallidus and the neostriatum for the putamen and nucleus caudatus is called into service. The Vogts understand by the words *pallidum* and *striatum* the same concept in general.

It was impossible to speak of all of the factors brought out by Souques, but emphasis was put upon:

1. Importance to substantia nigra.
2. Encephalitis and its lessons.
3. The lack of real understanding in the Congress of what is meant by emotional factors. Courbon and Lepine alone realizing what modern trends mean in the emphasis upon emotional forces and constitutional pathology.

The talk then went on and took up the work of Gustav Roussy

and his coworkers, chiefly Lhermitte and Cornil. Pictures of these and the Paul Brouss Hospital were shown, and some remarks made upon these neurologists and their researches. Roussy's brilliant work upon the thalamus and many others were rapidly alluded to.

Dr. Jelliffe then showed the portraits of a group of French neurologists that had given a brilliant series of lectures to post-graduates and undergraduates at the University Medical School. (These are now available in a fine monograph. *Les Actualités Neurologiques*, Masson et Cie, 1922.)

He rapidly sketched the personalities and work done by Leri, Bouttier, Guillain, Cruzon, Sinton, Vurpas, Bourguignon, Behague, Sicard, Foix, Laignel-Lavestine and other representatives of present-day Paris neurology.

The Dejerine Foundation was then described and the portraits of Mme. Dejerine, André Thomas and Jumentié shown. Several of the Dejerine Salpêtrière groups were shown. Mme. Dejerine and Ceilliers' work on the Osteoarthropathies, and Thomas' work on the Pilomotor Reflexes shown by lantern slides.

Dr. Jelliffe then took his auditors to Switzerland, stopping with Dr. Robert Bing at Basel and then to v. Monakow's collections in Zurich. He showed the master at work surrounded by his pupils and then showed a number of slides illustrating v. Monakow's ideas of the integration of bodily function, the choroid plexus and its relations to mental and nervous disease. A rapid visit to Burghölzli Hospital and to Prof. Bleuler was made and the present tendencies of psychoanalytic applications to psychiatry touched upon.

Dr. Jelliffe then went to the Neurological Institute of Vienna, showing pictures of its rooms and equipment, of Marburg, Pollak, Spiegel and assistants in the laboratory. The recent work going on in the Institute was related, particular attention was given to some of Spiegel's recent work in the vegetative nervous system. References were also made to the work of v. Economo in encephalitis and of Wagner v. Jauregg and the malarial treatment of paresis. Dr. Jelliffe spoke of the technic and the patients he had individually seen. He also alluded to later discussions held at Braunschweig with Weygandt, Nonne and others whose results were encouraging as to this newer attack upon paresis.

From here the speaker took his hearers to Kraepelin's Clinic at Munich which was well illustrated by a number of slides. He spoke of the death of Alzheimer, Nissl and Brodmann, giving short accounts of these workers with all of whom he had been in personal touch. Kraepelin himself he saw in Italy and his energies were directed towards building up his Research Institute in which he had an able ally in Rüdin. Dr. Jelliffe spoke of the living conditions in Munich, which were excellent on the surface but which were held together under a high state of tension. The scientific work in the clinic was as active as ever, Spielmeyer and Spatz carrying on the Alzheimer traditions and enlarging the scope of their investigations beyond purely cellular alterations.

Berlin was rapidly visited. Portraits of Rothmann, Lewandowsky, Oppenheim and Erb were shown and brief resumé's of their

work given. A visit to the Vogts, with portraits, was described, and the extensive work of the Vogts and Bielschowsky outlined. Vogt's program as to the work to be done on the cortex was briefly discussed. The work on the striatum also was outlined.

Dr. Jelliffe then gave a very rapid summary of the work done at the Braunschweig meeting of the Deutsche Nerven Aerzte. Strümpell's Amyostatic Symptom Complex was the subject and comparisons were drawn between the work at the Paris and Braunschweig congresses on the same subject of the physiopathology of the striatum region. Portraits of a number of those participating were also shown. Nothing but the most cordial courtesy was extended throughout the congress.

Dr. Jelliffe dwelt for a moment upon the fascinating work of Lewy on experimental studies of metabolic pathways of vegetative function. Lewy, with Brugsch and Dresel have commenced a direct attack upon the neurology of metabolism and have shown the importance of mesencephalic structures for the integration of visceral functioning, a subject which was near to the speaker's interest, since he had been talking about it to the New York Neurological Society for some years past, ever since Wilson had called attention to the liver in his lenticular syndrome.

Brugsch, Dresel and Lewy showed that in guinea pig experiments when small localized portions of the medulla are wounded and complete metabolic analyses carried out and complete controls of the degenerated areas and secondary degenerations followed by serial sections. Hyperglycemia and glycosuria took place when the dorsal vagus sympathetic synaptic zone is wounded, unilaterally and bilaterally. Lesion of this region is the cause of the so-called Claude Bernard sugar phenomena. Retrograde degeneration permits one to follow down fibers to a nucleus periventricularis where changes in the ganglion cells are present. Lesions of the ganglion cells of the ganglion habenulae are also to be found. These authors also believe that within the dorsal vagus vegetative nucleus, sympathetic and parasympathetic cells exist. The disturbance of one group lying in the posterior third of this zone leads to a hyperglycemia, whereas lesions of the anterior portion of the nucleus tend to cause a hypoglycemia. The authors also believe that an important synaptic station in the pathways involved in the coördination of the salt and water distribution of the body is to be found in the formatio reticularis on the median side of the corpus restiforme, lying close to a parotid secretion zone. In one and a half hours after an injury to this zone there is an increase in the sodium chloride of the blood. Dr. Jelliffe referred to Prof. Winkler's new anatomy and his suggestions relative to the metabolic functional paths of the formatio reticularis.

The following slides were shown of these studies:

Fig. 1. Lesion in dorsal vagus nucleus sympathetic.

Fig. 2. Gangulae habenulae changes.

Fig. 3. Enlarged portion of Fig. 2—Nucleus periventricularis. N.D. Nucleus periventricularis degenerated. R. Subthalamic region.

Fig. 4. Section from 3 in region of normal nucleus periventricularis.

Fig. 5. Section from 3 in region of degenerated nucleus periventricularis. G. Normal. G1. Degenerated ganglion cells.

Fig. 7. Lateral portion of ganglion habenulae.

Fig. 8. Operated side showing degeneration.

Dr. Jelliffe said he was forced to leave the Amsterdam workers out, but promised to return to them at a later meeting. Winkler, Kappers, Brouwer, Boumann, Bolton, Muskens, Wertheim Salomonson, V. Kleijn, Magnus and others were mentioned rapidly.

He then took his auditors to London and the Queen's Square Hospital, the organization of which was outlined. Here English neurology was enshrined although many notable figures had never been officially connected with Queen's Square.

Dr. Jelliffe rapidly ran over Head's newer aspects of the aphasia problem and spoke of Head and Riddoch's work on the Mass Reflex, bringing the latter into coördination with the studies of Lhermitte on the cord and of André Thomas on the Pilomotor reflexes.

He spoke of the death of Henry Maudsley and of his contributions to psychiatry, considering Maudsley almost the only figure of English psychiatry that spoke in the language of Dynamic Psychology. Only with the great war did English psychiatry awake from a formless static inertia that was difficult to understand, Stoddart among the older group alone comprehending the real situations as Maudsley had seen them. Mercier's crabbed satire had seemed to cramp psychiatry in England almost as effectually as he himself had been locked up by his venom and his rigid "logic," both of which he used to ridicule his adversaries.

That English psychiatry had begun to awaken was evident and he showed a number of slides illustrating Sir Frederick Mott's work on the Gonadal changes in Dementia Praecox. He showed Mott at work in the new Maudsley Hospital, with lantern slides of the hospital itself. He called attention to the fact that almost every endocrine organ had been indicted by different investigators. Undoubtedly the most radical alterations were to be expected in spermatogenesis and oögenesis, and even in the cells of Leydig—all of which Mott's sections showed were gravely altered. Whereas Mott argued chiefly for these gonadal changes as of primary significance, Dr. Jelliffe emphasized his belief, which he had frequently expressed before this same Society, that they were results and not causes. When, to use Southard's phrase, a fourth dimensional psychiatry becomes thinkable, the life movement of the organism as a whole must occupy the focus of attention. This dynamic urge, which like time, forces the individual along lines of behavior, metabolic or social, which have a definite entelechy. The continuance of life is life's chief function. This has been written into every cell of the body and is of the essence of its expression. Naturally the gonadal system, more perhaps than any other structures, must record this push.

Nature's great aim may be conceived to be to develop adult psychosexual individuals. Practically all mankind is struggling

along this pathway and halting at various levels of psychosexual evolution. The chief criteria to determine the stage of this development in any individual case, are found in the unconscious. The psychoanalytic technic alone can determine this. All the previously orthodox criteria of so-called group logic are usually camouflage substitute products. In the study of unconscious processes one may be able to determine, in a manner analogous to that used by the paleontologist to determine a geological horizon, just what stage the individual has reached in his psychosexual evolution. His dynamic strivings bear a direct relationship to this grade of development, and his constitutional diseases, speaking in general, develop in definite associations with his dynamic strivings. Dr. Jelliffe said he had developed this theme before this Society frequently and it was not necessary to go over the ground, but so far as the findings in any group of organs of the body were concerned, particularly so far as the Mott gonadal changes, the faulty psychosexual evolution of the individual, so far as his wish life were concerned—these because libido was turned away from the reality functions of life, were responsible for the changes in the bodily structures. The faulty *wish* caused the disease which structurally was expressed in regressive anatomical changes, and so far as *conduct* was concerned, by a series of *potency wish substitutes*.

Dr. Jelliffe then went on and discussed the work of S. A. K. Wilson and the striatum syndromes, bringing this author's contributions in line with the work done at the Paris Neurological Conference to which Wilson himself had contributed, and to the Braunschweig meeting where the same subject was discussed.

He promised to discuss the psychoanalytic movement at a later meeting.

At the close of Dr. Jelliffe's lecture, it was moved, seconded and carried, that a vote of thanks be accorded to the speaker for his very interesting and entertaining presentation.

The Society then adjourned.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, FEBRUARY 16, 1922. DR. F. H. PACKARD, PRESIDENT, IN THE CHAIR

AN EXPERIMENTAL STUDY OF THE MECHANISMS OF HALLUCINATIONS

Dr. Morton Prince presented this paper in which he reported upon the results of an experimental research in the mechanism of hallucinations. The traditional theories, he said, which could be classified in two groups—anatomico-physiological and the psychological—were all unsatisfactory. As the result of previous study Dr. Prince had reached the conclusion that visual hallucinations were the emergence into consciousness of normal imagery pertaining to

subconscious processes. The method of investigation previously employed by him was that of introspection in hypnosis, by which memories of subconscious processes were obtained. It remained to prove this theory by objective methods.

For the purpose of such a research there was required a subject who exhibited both visual hallucinations and synchronously occurring subconscious processes which could be "tapped" by methods permitting physical records of the same to be obtained, namely, so-called automatic, *i.e.*, subconscious, writing. Such a script, of which *the subject was not consciously aware during its production* would obviously be a physical record of ideas occurring subconsciously and if a hallucination occurred synchronously its imagery might be correlated with the ideas of the script if the theory was valid.

Such a subject, one that had previously reported the occurrence of visual hallucinations while automatic script was being unconsciously produced, was at hand. The technique of the experiments was as follows:

The head of the subject was covered with an opaque cloth to prevent her seeing the script as it was being written automatically by her hand. A pencil was then put into her hand which rested conveniently on a sheet of paper placed on a writing tablet by her side. She was then told to write automatically regarding some subject which was designated in general terms in each experiment: for instance, a memory of some remembered episode in her life; a memory of such an episode, but one forgotten by the subject; a fantasy; a fabrication requiring constructive imagination; etc. The object of diversifying the subjects was to obtain products of different kinds of subconscious work (memory, dream-like fantasy, imaginations, etc.). If, during the experiment while the hand was writing, a hallucination developed, the subject was directed to indicate the fact the moment she saw it by exclaiming, "picture". Thereupon a mark was made on the script at the point where the picture appeared. Likewise the moment the hallucination disappeared the subject exclaimed as directed, "gone", and the point was similarly marked on the script. Thus those words of the script which were written during the occurrence of any given hallucination could be identified and could be compared with the latter and any correlation of the written ideas and the hallucinatory images noted.

Under these conditions it was found that *the writing of the script by a subconscious process was accompanied by a synchronously occurring hallucination.*

After the observation was complete the script and the hallucination as recorded were compared and for this purpose arranged in parallel columns. Thus any correlations between the imagery of a hallucination and the synchronously written script could easily be noted. (The paralleled results, script and hallucination, were exhibited on the screen by lantern slides.)

On comparing in this way the description of the hallucination with the script it was easy to recognize that *the images of the hallucination corresponded with the ideas recorded in the script and were*

such as normally would be the imagery contained in those ideas. For example: the script described a memory of a particular scene in a room at "Harvard University" and the imagery of the visual hallucination was an exact reproduction. The script was a verse describing in allegory a treasure chest, a fountain, golden musical instruments, etc., and the synchronously occurring hallucination was a perfect visual representation of those ideas, such as normally would be the case. The script described a fabricated romance and the personages of the romance and the local scenes were faithfully represented by the visual imagery of the hallucination; and so on.

After the observations were made the subconscious process was directed to answer in writing a questionnaire directed to ascertain what sort of process occurred subconsciously during the hallucinations and the relation of the one to the other. The script testified that during the production of the script images corresponding to the written ideas appeared first subconsciously, without the subject being consciously aware of them, and that then *those images emerged into awareness as the hallucination.*

A second series of experiments was made, the converse of the preceding. That is to say hallucinations were primarily produced by fixation of the attention and the automatic script employed to determine what sort of subconscious process, if any, and its content, occurred synchronously.

The results were the same as in the preceding series.

Auditory hallucinations were found to have the same mechanism as was also the case with the imagery of a dream.

The following conclusions were drawn: (1) There is a type of visual hallucination in which the imagery has its source in a dissociated mental process of which the subject is not consciously aware. Such a process is by definition a subconscious one; (2) The content of this subconscious process contains images identical with the normal imagery of conscious thought; (3) The hallucination is due to the emergence into consciousness of the previously subconscious images. This emergence necessarily results in a hallucination in that the imagery of the latter is not related to the content of the conscious train of thought but is foreign to the latter. This is a necessary consequence of the imagery being normal elements in a separate dissociated train (mental process); (4) The subconscious process is essentially a co-conscious one of thought; (5) There is a type of auditory hallucination which has essentially the same mechanism; (6) As there is a type of hallucination (visual and auditory) occurring in the insanities which is identical in form, structure and behavior with that produced experimentally in this study, the conclusion is justified that such hallucinations of the insane are due to the same mechanism; (7) The implication follows that when hallucinations of this type occur in the pathological psychoses, they are indications of the activity of a dissociated subconscious process as a factor in the psychosis; (8) The hallucinatory phenomenon carries the further implication that the genesis and psychopathology of the psychosis are to be found in the forces which have determined the dissociation

and motivated the subconscious process; (9) It is not to be assumed that all hallucinations have the mechanism of the type here studied. It is possible that in those occurring in the intoxication psychoses and in certain forms of organic brain disease, particularly where the hallucination is of a simple unelaborated static structure, the imagery is induced by direct irritation of the cortical or subcortical neurones. It is difficult, however, to exclude the possibility that the intoxicating agent or organic process simply removes inhibition and permits subconscious dissociated processes to function. Nor can we find any analogy with the known effect of irritation of motor and other areas of the brain. Irritation, as observed, produces simple movements and simple sensory phenomena (noises). Still, the possibility of irritating factors becoming the immediate excitants of organized complexes of neurones underlying the hallucinations, cannot be excluded. This theory, however, needs to be proved. Even the irritative theory, as opposed to the psychogenetic theory, permits of the interpretation that the irritation excites a dissociated subconscious process from which images emerge into consciousness; (10) The psychological problem of differentiating between normal imagery and hallucination disappears in that they are identical, the hallucination being only the normal imagery of a dissociated subconscious process; (11) If the evidence given by subconscious introspection be not accepted, a possible interpretation of the hallucinatory imagery is that the images do not themselves occur primarily as subconscious elements, but by the same mechanism appear in awareness as the conscious correlates of a co-active dissociated physiological process. In other words, a subconscious process is neural, not psychical. On the other hand, such an interpretation does not take into account a large mass of collateral evidence for the psychical nature of processes occurring outside the field of awareness; (12) So far from a hallucination being a regression to an infantile form of thought (Freud), it is an element in highly developed adult thought processes; (13) The mechanism of the imagery of some dreams is the same as that of the hallucinations of the type here studied.

Discussion: Dr. Donald Gregg asked how can one determine that what is being written is unknown to the individual?

Dr. Prince said that in one sense one cannot, any more than one can tell when a person comes into the office and says that he has a pain in his back, that he is telling the truth and is not a malingerer. It must be borne in mind that automatic writing, like lumbago, is a very common phenomenon and has been observed and recorded by a large number of experimenters in all countries. It is, therefore, a well established phenomenon. It is always possible that any given person may be a malingerer and the question, if raised, must be determined as in the malingering of other conditions. Let no one imagine, however, that medical men and scientists generally have a monopoly of integrity. The particular subject who was used in these experiments had written a very large amount of material long before she came under my observation. She wrote automatically for her own pleasure. A number of investigators have trained them-

selves to write subconsciously and their testimony is unimpeachable. It is not a difficult thing for some people to acquire. In an audience like this, no doubt two or three automatic writers given proper conditions could be found; then after say a month's practice and training a fair percentage of those present probably could produce automatic script.

Dr. Donald Gregg asked if this particular individual knew what she was writing?

Dr. Prince said no. Automatic writers differ very much in this respect. Some have no awareness at all of what the hand is writing and indeed may not know that the hand is moving at all for in some cases the hand becomes temporarily anesthetic during the production of the script, as was first shown by William James. In other cases the written ideas of the script emerge into consciousness during the writing and yet it is automatically or subconsciously produced, as is shown by the fact, in such cases, that if the writing is stopped at any given moment the writer is found to be ignorant of what is going to be written and cannot consciously finish the sentence and the theme.

Whether or not the subject is aware at the moment of what the hand is writing is not in principle of importance for the script is still produced automatically. It may be of importance only for the particular experiment that is being made. Then again, writing may be obtained from a person who had previously had complete anesthesia of the hand. The subject therefore cannot tell through the muscular action, what the hand has written or know that the hand has moved at all.

An important phenomenon, frequently observed during subconscious writing where the subject is unaware of the written ideas, is the emergence, not of the ideas, but of the *affect* pertaining to the subconscious process. The affect of exaltation or joy, or depression or fear, may thus emerge into consciousness when such an affect does not belong to the conscious thoughts of the writer but can be traced to the subconscious process. This phenomenon I have observed hundreds of times under experimental and other conditions. I believe this to be the mechanism of the emotional state in many of the psychoses such as manic-depressive states, some phobias, and even in many normal conditions. The affective condition is due, as I have said, to emergence into consciousness of the affect belonging to a dissociated subconscious process.

In answer to the question whether a subject can perform another action at the same time that he is writing, Dr. Prince said, in general, yes. But the performance of the action differs somewhat with its nature. He can perform all ordinary movements, subject of course to the necessity of writing at the same time. He can observe accurately everything going on about him, such as watch and recognize accurately and without confusion what is passing in the streets, comment upon and enjoy the situation, read aloud from a book, and so on. In the last instance, however, he is liable to go into a dreamy state, in which he keeps on reading. The trouble here is, I think, that it is difficult, even if possible, for two different processes to make

use of the language function at one and the same time. There is apt to be blocking of one by the other. On the other hand, according to my experience, an automatic writer can passively observe, think freely and reflect upon what he observes while the automatic writing is being produced. During the writing by such subjects, as I have observed, it was difficult for the subject to find the precise language in which to express his conscious thoughts. In other words he seemed to be largely robbed of the language function by the writing subconscious process.

Dr. D. A. Thom asked if the emotion of the subject were appropriate to the hallucination she was going through?

Dr. Prince said: Yes; in this connection, as an example of the emergence of the mood belonging to the subconscious processes, I may cite one observation in this study which is of interest. When the subconscious system wrote as a joke a pretended spirit message and while this system, under interrogation in regard to it, manifested through the script, a humorous, almost hilarious mood, the subject herself without obvious reason was consciously in high spirits, joyful and felt the spirit of fun. Later, during the latter part of the examination, when the subconscious system wrote bitterly and remorsefully of the past, confessing subconscious sins, the subject remarked during the production of this script, without knowing what the hand had written, "I feel serious now. All my high spirits and feeling of fun have left me. I have a sad, remorseful feeling".

I am astonished that psychiatrists have not made use of induced hallucinations in order to study the mechanism of hallucinations in the insane. Here is material and the method right at hand for experimental studies. The observations can be controlled, the hallucinations traced to their origin, etc., and we have at least an approach for attack of this and many other psychiatric problems. Likewise automatic writing is a most valuable means of research. [Has been done for many years by other instigators. See Literature by Silberer.—Ed.]

In reply to the question if it were as easy to get automatic writing from the insane as from normal people, Dr. Prince said: Unquestionably, no. It is necessary to have complete coöperation between the subject and the experimenter and in most insane people that is impossible. Then, too, the dominating mental processes of the insane block the impulses of any subconscious processes that might be stimulated to write automatically. On the other hand there are many borderline cases, like those of the early stages of dementia praecox, in which automatic writing might be easily obtained and the experiments of the kind I have mentioned carried out.

Dr. E. W. Taylor asked: How about febrile delirium? He recalled a study made some years ago by Dr. Prince of a postpneumonic delirium in which you were able to explain the character of the hallucinatory phenomena that resulted.

Dr. Prince said it was a case in which during the delirium there were in activity normal co-conscious processes which perfectly oriented the situation, recognized clearly the delirious character of

the conscious process and fully explained the delirium, and hallucination. He had observed this phenomenon several times. In this connection he mentioned an experiment which he made comparatively recently in the case of delirium during typhoid fever and continuing during convalescence. He was asked to relieve the insomnia present by hypnotic suggestion. As he had a suspicion as to what might be the psychogenic cause of the delirium he took the occasion to make the experiment, although he had little expectation at the time of success. While the patient was in hypnosis he made various explanations and suggestions along the line of the hypothesis which he had formed as to the real cause of the delirium. The patient was living at that time in the country. He left him fast asleep and returned to Boston. He had hardly reached his house before the telephone rang and to his surprise the patient was at the other end and reported, to his great delight, that he had entirely recovered; that he recognized the delirious character of his ideas and that he was all right again. His delirium disappeared for good and to his surprise his experiment was a success. His explanation was that the delirium at the time of the experiment was entirely functional. Whether this was its nature during the fever it is, of course, impossible to say, but if not it must have become transformed into a functional delirium. In the case of pneumonia, to which Dr. Taylor referred, he thought it must have been a functional delirium from the beginning.

Dr. E. W. Taylor asked if he thought such a method could be used generally?

Dr. Prince said he thought not and practically for the same reason that the method is not practical in most cases of insanity. Perhaps, however, it might be used more than one thinks.

Dr. F. H. Packard said he understood Dr. Prince to mean that the toxic condition had disappeared, when the experiment was made, that there would be more chance of success under those circumstances than during the toxic period.

Dr. Prince said: Precisely, if the primary delirium is really due to the effect of the toxemia. But I think that this pathology may be fairly questioned. To my way of thinking it is more probable that such delirium is due to the loss of suppressions. The toxemia paralyzes the normal inhibitions thus permitting the abnormal processes constituting the delirium to take place, somewhat after the fashion of dreams.

Dr. E. W. Taylor said that in the hallucinations of smell which we occasionally see in tumor of the tempero-sphenoidal lobe, there certainly appears to be a structural origin.

Dr. Prince said he thought one might get a simple sensory phenomenon from a structural origin, such as a smell, a flash of light, or a noise like buzzing or whizzing, but not a complicated process—like a visual picture or the musical strains of grand opera; that is to say, elaborate ideas with meaning.

Dr. E. W. Taylor said the original stimulus is certainly organic, whatever the elaboration of it may be.

Dr. Prince said simple sensory and motor phenomena may result from the pure stimulation of an organic process, but elaborate hallucinations are not built up. He said he had not found any accounts of such cases in the literature. Organic irritation of a motor center will produce simple movements like the flexion or extension of a limb; but did you ever hear of an organic irritation or a motor area exciting the complicated movements of a baseball pitcher—spitting on the ball, rubbing his hands in the mud, winding himself up and then delivering a curved ball to a “Babe Ruth”? That is practically what one is asking an organic process to do in producing analogous sensory and ideational phenomena by this theory.

Dr. Hugo Mella asked: What is the theory of the mechanism of suppression in the nontoxic cases?

Dr. Prince said in such cases there is conflict, repression and consequent dissociation followed by the motivation of the dissociated system as a subconscious process by some strong anxiety, wish, aspiration or other impulse. The original break up in this patient, for example, was due to a conflict between two sides of her nature, one longing for another, an intellectual life, believing that she had musical and other talents and hating the banal life she was obliged to follow; the other side motivated by the ordinary sense of duty and obligation and certain urges. It would take us too far away to go into these.

In reply to the question by a member whether he “asked the subject a question which was really directed to the subconscious and answered by the hand”; he said that this inquiry raises a very complicated problem. As ordinarily expressed, “I asked the hand, or the subconscious, a question”. This, of course, while the subject was not hypnotized. That seems a paradox. It is, of course, a figure of speech. And, after all, it is a figure of speech to speak of the subconscious as a separate mind. We are really dealing with different mental systems or complexes of which the mind is constructed and which are more or less closely integrated into one mind. They are all one mind and there is only one mind, however much the different systems of which it is composed may be temporarily disintegrated. In the latter condition the systems are out of gear, out of harmonious integration and coöperation. And yet by simply talking to a person you can reach the dissociated systems. It is not necessary to hypnotize the subject and bring these systems into the content of conscious awareness. Let us speak in terms of stimulus and reaction. A given stimulus strikes and awakens a reaction from a system which is so organized and attuned to it that it will react. Otherwise no reaction will follow. Thus, for example, if the composite content of conscious interest is solely occupied with thoughts and affects of a baseball game, a stimulus suggestion related to religion and going to church will awaken no reaction from the baseball content of conscious awareness, but it will, or may, strike and awaken a reaction from a subconscious system of religious memories, ideas and emotions, even though it be dissociated and though the memories be consciously forgotten. In practical therapeutics this

principle is of the greatest value. However the fact be explained, the fact remains that questions and suggestions can stimulate and awaken a reaction from a dissociated system even though they have no meaning for the content of conscious awareness of the moment. The personality can be compared, in a way, to a complex manufacturing establishment, like the Ford plant. There is the casting department, the department where cylinders, gearing, bolts, nuts, wheels, bodies, etc., are made, and the assembling department. All are under a central executive control. Accordingly they all work harmoniously. But sometimes a strike occurs in one of the departments; the cylinder department refuses to cooperate and make cylinders. Not only efficiency is impaired, but economic adjustment of production of the integral parts to the total output is disarranged. The executive must get in touch with the group of strikers. He can do so without disturbing the other departments. Any questions, directions, or appeals to the strikers will not awaken a response from the other departments that are at work. In the same way we can have a strike in any of the different systems of the mind and it can be settled in the same way—by arbitration, conciliation, persuasion, or suggestion.

Of course our knowledge of the integration of the systems of the mind is very superficial and any explanation is incomplete. We can hold, however, to the empirical facts of experience.

As to psychotherapeutics: it is an art, not a science, though it makes use of scientific principles. This is one of the difficulties in teaching it. You can teach principles but their application is an art that comes from experience, like painting a picture.

As to the principles, what I am now going to say may sound very arrogant but I am going to say it: To investigators who have had a long training in psychological phenomena and particularly subconscious phenomena, and are familiar with them from personal observation and experimentation, as a bacteriologist is trained in bacteriology and a physicist in physics, the Freudians for the most part seem like amateurs, because very few, if any, show by their writings that they are familiar by personal training and experience with all the phenomena of the subconscious. What would you think of a person who undertook to formulate laws regarding the electrons, atoms, electricity and determine the ultimate nature of matter who had only read the writings of physicists and whose own experiences were limited to the phenomena obtained from an amateur's wireless outfit, or to studying the discharge from a particle of radium or an X-ray machine? Even Freud, himself, has never shown by his writings that he possessed the requisite training and experience, though he may not have disclosed it. Indeed he has repudiated the use of methods of research which others have found to be essential. One must know all the phenomena of the mind and not only those obtained by a single method of research like that of "free association" if one is to reach sound conclusions regarding the laws of the mind.

CURRENT LITERATURE

II. SENSORI-MOTOR NEUROLOGY.

1. PERIPHERAL NERVES.

Boschi and Perrone. RESULTS OF SURGICAL OPERATIONS ON PERIPHERAL NERVES. [Policlinico. Sez. Med., 1919.]

We have made neurolysis—direct sutures, distance sutures, plastics with flaps, and stomosis—excisions of large neurons. We have operated on the most peripheral nerves, even on the musculo-cutaneous branch of the n. peroneus and on the n. tibialis posticus.

Our most important conclusions are the following:

(1) We have found useless the technical proceedings recommended by French authors in order to save the nerve during the operation (continuous bathing with physiological solution, special clamps, etc.); it is quite sufficient to follow the simple general laws of the maximal asepsis, perfect haemostasy and surgical delicacy.

(2) It is possible to elongate the nerves (especially the sciatic nerve) by the means of a soft and graduated extension.

(3) When a causalgia is caused by a really external compression of a nervous trunk, without degenerative changes, the neurolysis if complete has an immediate favorable action as it allows a rapid and complete success to other treatments (high frequency). In other cases, when the compression had caused evidence of nerve lesion but neither signs of interruption nor causalgia the neurolysis was followed by a complete recovery.

(4) We prefer direct sutures to any other method; we have followed the simplest technic: 1-2 silk points 00—a circular crown of neurilemmetic points with catgut 00, with pedunculated fat flaps around the suture. The results obtained with other methods have not been very encouraging, notwithstanding we have tried every means recommended to prevent the suture from secondary adherences.

(5) The electrical excitation of the naked nervous trunk is absolutely exempt of danger if correctly applied; it may be useful in some cases in order to recognize the nerve during the operation; it is, too, very useful to establish the fascicular topography of the nerves.

(6) Nervous lesions were often complicated by conspicuous alterations of blood vessels, which may explicate some trophic and vasomotor troubles, better than pathological changes of the nerves. These lesions require a particular surgical care. [Author's abstract.]

Nové-Josserand, G. SACROLUMBAR PAIN AND LUMBAR VERTEBRA. [Lyon Chirurgical, November-December, 1919.]

Nové-Josserand reports five cases in which patients complaining of pain in the sacrolumbar region were found on roentgen examination to present malformation of the fifth lumbar vertebra, an abnormal development of the transverse processes which were too long, and often too wide, crowding the fifth lumbar nerve. The fact that when the malformation is unilateral the pain radiates from the same side would seem to furnish strong proof that the malformation is the direct cause of the pain. Resection of the transverse processes does not seem irrational in treatment of this sacralization of the vertebra, causing lumbar neuralgia. [J. A. M. A.]

2. CRANIAL NERVES.

Courbon. THE SYNDROME OF PALSY OF THE CRANIAL NERVES OF THE JUGULAR REGION OF THE CRANIAL CAVITY (TWELFTH, ELEVENTH, TENTH, NINTH, SEVENTH, MOTOR FIFTH AND SPHENOPALATINE GANGLION) DUE TO FRACTURE OF SKULL. [Lyon Médical, 1919, CXXVIII, April, p. 196.]

Courbon reported to the Medico-Chirurgico-Military Society of the fourteenth region on July 27, 1917, the case of a soldier whose skull was probably fractured by a shell explosion which slightly injured his ear and scalp. He was comatose for six days; and, on coming out of the coma, showed clear signs of a lesion of the right seventh, ninth, tenth, eleventh, and twelfth cranial nerves, the motor fifth root, and the sphenopalatine ganglion of the same side. There was great atrophy of right half of tongue, with R. D. of the lingual muscles but not of the infrahyoid muscles; slight atrophy of upper part of right trapezius, with diminution of Faradism and slow galvanic response; complete paralysis of right vocal cord in abduction, hemiparesis of velum palati with regurgitation of liquids through the nose during deglutition; hypæsthesia of right velum palati and right half of pharynx with loss of right pharyngeal reflex; hypæsthesia of external auditory meatus, eructating cough without stethoscopic signs, hypersalivation, with a tendency to tachycardia, the pulse not going lower than 82 after even many hours of recumbency. Difficulty of swallowing of liquids. Vernet's "curtain movement" of right half of pharynx. Hypoageusia. Flaccidity of right cheek, with lagophthalmos: electrical changes in facial muscles. Atrophy of right temporal and masseter, with electrical changes, but preservation of sensibility. Hypæsthesia of right nasal fossa and right half of velum palati. We know that from the sphenopalatine ganglion emerge the inferior nasal, nasopalatine, anterior and middle palatines, and the posterior palatine nerves, which enter the maxillary division of the fifth nerve. Courbon gives reasons for his opinion that the lesion of the cranial nerves in his case was a fracture of the skull in the jugular region. [Leonard J. Kidd.]

Spolverini, L. POSTDIPHTHERIC PARALYSIS. [Riv. di Clin. Pediatrica, December, 1919, XVII, No. 12. J. A. M. A.]

Spolverini queries whether the postdiphtheric flaccid condition of the muscles should properly be called paralysis, as the disturbances are more in the nature of myasthenia in the majority of cases and in four he describes here and compares with similar cases on record. In three of his cases the disturbances were arrested with antitoxin, and they retrogressed completely in from twenty to forty days. The larger the amount of antitoxin injected, the prompter the cure. In the fourth case the antitoxin had not been commenced until the twenty-seventh day, and only comparatively slight improvement was realized. These cases teach further the necessity for taking smears from the nose with postdiphtheric paralysis, as this may reveal virulent diphtheria bacilli. Some even assert that nasal diphtheria is more apt than other forms to be followed with paralysis.

3. SPINAL CORD.

Noïca and A. Radovici. SUPPRESSION OF THE BABINSKI REFLEX. [Revue Neurologique, December, 1919, XXVI, No. 12.]

Noïca and Radovici repeat the advice given by Babinski that it is never safe to state whether the Babinski reflex is positive or negative if the foot of the subject is cold. Cold will seriously interfere with the complete development of the reflex.

Schiboni, L. ACUTE MYELITIS IN EPIDEMIC ENCEPHALITIS. [Poli-clinico, 1920, No. 39.]

In the decreasing phase of the epidemic of encephalitis which occurred in Rome in 1920, the author had occasion to observe a case of very acute myelitis, developing with the phenomena of Landry's acute ascending paralysis. The study of the case is preceded by a wide review of the histopathological data interesting the nervous system in epidemic encephalitis. His findings are as follows:

The first are examples of characteristic perivascular infiltration, though presenting injuries of an acute character, similar, although not so intense as found in the ganglion cells. In the muscles, and particularly in those that during life had been subjected to intense clonus Schiboni and Bompiani found in the histological examination a diminution in number and volume of the fibers, and an augmentation of the nuclei; and here and there an augmentation of interfibrillar connective tissue and of the fat cellules in the internal perineurium. The author interprets such state of things as a simple atrophy, whilst the apparent increase of the nuclei is due to the shortening and tightening of the axis of the muscular fibers struck by atrophy.

The subject of the study of myelitis was an Irishman, aged nineteen, who, after having assisted at a great ceremony at St. Peter, feeling tired, as soon as got back to his dwelling took a cold shower bath. After

this he felt vague muscular pains. The following day he had a fever of a continuous type, only very slightly decreasing ($39-39.5^{\circ}$ C.); there appeared a slight headache, the muscular pains grew more intense and diffuse, particularly in the inferior members. In the second day of fever a flaccid paralysis of the inferior members happened. The paralysis extended afterwards to the muscles of the body, not allowing the patient to sit or to move in bed. No defecation. Suspended urination. All senses clear. On third day appeared difficulties in the deglutition and esophageal spasms with vomiting. The respiration was only slightly augmented in frequency; when in an attack of dyspnea the patient died after four days of illness. The objective examination did not give, in addition to the symptoms referred to, anything more than a reddening of the pharynx with reddened and swollen tonsils. The cutaneous and deep sensibility was not explored. The examination of the cranial nerves gave a negative result. Also there was an absence of injuries referring to the bladder and to the rectum.

The postmortem examination showed the evident state of denutrition of the subject and an intense hyperemia of the jaws, of the pharynx and of the trachea; as well as a passive hyperemia of the inferior lobes of both lungs; a congestion of the liver, of the spleen and of the kidneys. The heart was flaccid and dilated. In opening the cranium and the vertebral canal the dura was hyperemic. The cerebral lining was hyperemic but not the remaining parts of the brain.

The medulla was found diminished in consistence, particularly in the lower region and hyperemic and succulent, particularly in the dorsal, with exception of the lumbar and cervical region. The destruction of the gray formations and particularly of the posterior protuberances of the white substances was not very clear. The microscopic examination of fragments taken from several segments of the cerebrospinal system showed in an evident manner the integrity of the pyramidal tracts, the injuries being limited to the spinal medulla. Here they appeared more serious with reference to the dorsal part than in the lower and cervical sector, having anyhow similar characters throughout.

The alterations in the microscopical examination of the medulla spinalis consisted in:

(a) Perivascular infiltrations of lymphocyto-similar elements round the blood circulation system, particularly at the veins, equally in the gray as well as in the white substance; rare infiltrations about the bigger vessels which follow the pial-secta and go deeper from the internal surface of the pia in the medullar contexture; the ependimal channel appeared as abstracted owing to the proliferation of the side wall elements.

(b) Against the gray substance of the rear horns, and more particularly of the anterior, it was found that a diffused infiltration had taken place constituted by cellular elements with same characters constituting the perivascular infiltrations. In the thickness of the infiltration appeared

as well centers of miliary necrosis represented by a "detritus" in which were found also red globula partly commixed.

(c) The nervous cellules of the anterior horn (and also those of the posterior part) appeared in the preparations according to Nissl's method, reduced in a great number, with the disappearance of many cellules of the tigroid body; the nucleus in some of them was inflated; in others nucleus and nucleolus disappeared and the protoplasma was of homogeneous aspect.

As already said, the injuries described were found in their most extension and most gravely in the medulla, excepting the cervical and lumbar section.

Having thus described the data referring to the case on hand, the author points out the resemblance with the case considered as a typical one of epidemical encephalitis and with that of Borna's illness, that is to say, that form of epidemical meningo-encephalitis of the brain that has been compared to the preceding form for many analogies.

He refers also the result of a case of acute paralysis (Landry) studied also anatomically by Pilotti and the histological data obtained in both cases.

As a conclusion of the investigation made also referring to Pilotti's case, Schiboni points out that in Pilotti's case it was a matter of diffused alteration of all the nervous system (central and peripheral) whilst in case on hand the morbus process struck only the medulla; and that in both cases the anatomo-pathological alterations in the microscopical examination seem identical to those characterizing the epidemical encephalitis; an illness which has been known later than Pilotti's publication.

So far the localization of the lesions stated by Pilotti differs widely from the characteristic data relating to the epidemical encephalitis, to which Schiboni's case is very similar.

The author of the present article, concluding from the various data in connection with those of also very similar facts happening in the glanders of dogs as well as in Borna's illness, in the epidemical encephalitis and in various other forms of acute myelitis, admits the hypothesis that such injuries may be caused by distinct groups of pathogenic groups not yet known, but very similar in themselves. In the case illustrated by Schiboni the epidemiologic criteria should also be considered because the case here described was observed on the decline of an epidemic of encephalitis in Rome. [Author's abstract.]

Marinesco, G. THE ORIGIN AND NATURE OF MULTIPLE SCLEROSIS.

[Revue Neurologique, No. 6, June, 1919.]

The author has undertaken a series of studies of multiple sclerosis based on two hypotheses, the primary inflammatory origin of the disease, that is. from a vascular viewpoint, and the exciting cause of the infla-

mation being an infective agent. This etiological view was advanced long ago by Pierre Marie. The lesions are chiefly localized in the white substance about the smaller blood vessels and their ramifications, and consist of foci of inflammation infiltrating the adventitia and perivascular tissues with lymphocytes, plasma cells polyblasts, etc. This inflammatory lesion, caused by a specific agent, must not be confused with the accumulation of macrophages in the vessel walls. These cells, the macrophages, contain lipoids from the digestion of the myeline substance, while the inflammatory infiltration is fundamental, and results from the action of the virus of multiple sclerosis, similar to that observed in other infectious diseases, while the accumulation of macrophages is simply a morphological incident in the digestion and disposal of fatty matter resulting from the reduction of myeline. Simultaneously with the infiltration of the vessel wall occurs a multiplication of the nerve cells. The infiltration is so great as to resemble an inflammatory nodule. The spinal meninges are invaded by the inflammatory process, which always attacks the smaller veins first. The involvement of the central nervous system keeps pace with the invasion of the multiplying virus so that the development of the sclerotic areas stands in a definite relation to the increase or decrease of the number of living germs.

On the other hand, the clinical picture, while variable, is still characteristic enough not to call multiple sclerosis a syndrome. In 1917 Kuhn and Steiner injected rabbits and guinea pigs with blood and cerebrospinal fluid from patients suffering from multiple sclerosis. The spirochete of multiple sclerosis were demonstrated in the guinea pigs. Almost all the animals developed motor disturbances within from three to fourteen days. The blood from the ear, or from the heart, revealed the presence of spirochete either by means of Loeffler's method, or through the ultramicroscope. In form and size they resemble the spirochete of hemorrhagic icterus. Sometimes they are extremely slender.

Bullock (Gye) was the first one to point out that multiple sclerosis is caused by a transmissible virus, and Simon later confirmed this fact by causing fatal paralysis by subdural injections of cerebrospinal fluid from subjects with multiple sclerosis.

Marinesco has repeated the experiments of Kuhn and Steiner at the Pasteur Institute, inoculating six guinea pigs with infected cerebrospinal fluid. The injections were intracerebral, intraspinal and intraperitoneal, the last named 3 cc., while 1 cc. was used for the first two methods. In the two pigs with intracerebral injections motor disturbances appeared on the third and fourth day, especially in the hind legs, so that these two animals could be caught more readily than the other four. The cerebrospinal fluid was removed by puncturing the fourth ventricle, and showed numerous motile spirochete under the ultramicroscope. Morphologically they resembled those described by Kuhn and Steiner. Marinesco's preparations were also examined by Petit and Roux who affirmed that the spirochete at least were not of the same

nature as the *Treponema pallidum* of syphilis. They were of unequal size, spiral, and somewhat more rigid than those recently described. [Author's abstract.]

Triantaphyllos. IRRITATION IN PATHOLOGY OF NERVOUS SYSTEM. [Revue Neurologique, December, 1919, XXVI, No. 12. J. A. M. A.]

Triantaphyllos defends the view that there is no such thing as a formula of cellular changes corresponding to so-called irritative lesions by which function is stimulated; that is, a formula that can be regarded as opposed to the destructive formula that diminishes the function. He holds further that every pathogenic agent and all pathologic conditions tend to abolish the function of the cell affected by the lesion. It is only when the pathogenic agent exerts an elective action on neurons that have an inhibitive effect on other neurons that the phenomena termed "irritative" appear. But these phenomena are not due to the fact that a so-called irritative lesion caused an increase in the function, but to the circumstance that a lesion with a destructive tendency has reduced inhibition (for the neurologic irritative phenomena) or has reduced the power controlling the normal ideation (for the psychic irritative phenomena).

Finzi, A. CONSTITUTIONAL ANOMALIES IN SYRINGOMYELIA. [Riforma Medica, December 20, 1919.]

In a study of familial cases the author records some observations in which four of the five children in a family or the mother and three children all presented syringomyelia. In a recent revision of twenty-one patients with syringomyelia he found an unusual number of malformations or other constitutional anomalies. Because of this frequency he believes that an inherited neuropathic taint is particularly common.

Ehrenberg, L. SPINAL CORD TUMORS. [Hygeia, December 31, 1919. J. A. M. A.]

In Ehrenberg's eight cases the tumor was in the dorsal region in five and the cauda equina in the three others. He found in two cases moderate lymphocytosis accompanying the Nonne reaction; in another case both were absent. The findings indicated that the slight lymphocytosis, xanthochromia and large globulin content are a sign of grave obstruction of the fluid by the tumor. The pure Nonne reaction was observed only when the stasis was not very pronounced. It was found in the fluid the same above as below the tumor.

5-6. BRAIN—MENINGES—ENCEPHALITIS—TUMOR.

Roger, H. THE PATHOGENESIS OF UREMIC MENINGEAL REACTIONS. [Annales de Medecine, 1919, pp. 360-385.]

The condition of the meninges in uremia may be divided into: (1) The acute forms of meningitis due to some intercurrent infection, as

pneumococci, meningococci, treponeme, and Koch's bacillus. (2) Those conditions directly attributable to the uremia, of which there are four types: hyperalbuminosis occurring with hypercytosis; albumino-cytological dissociation through hypercytosis; albumino-cytological dissociation through hyperalbuminosis; hemato-leucocytic formula. This is quite frequent. From a pathological viewpoint the author believes that in most cases these meningeal reactions are not directly caused by the nitrogen retention, but follow intercurrent cerebral complications, as softening and hemorrhages, and that it is only through the intermediary of cerebral lesion that they stand in an etiological relation to the renal sclerosis. [Author's abstract.]

Nizzoli, A. FOOT PHENOMENA IN MENINGITIS. [Revista di Clinica Pediatrica, December, 1917, XVII, No. 12. J. A. M. A.]

Nizzoli cites conflicting evidence from various writers on the constancy and significance of the various signs of meningitis in children, of which he enumerates a long list. The excitability of the nervous system in children causes a host of symptoms which obscure the diagnosis. The signs which depend on reflex action are the most instructive in children, as they cannot fight against them. In two cases of tuberculous meningitis he noted dorsal flexion of the big toe and a fanlike spreading of the other toes when he tried to induce the identical contralateral reflex. The other leg became spontaneously flexed, and the toes assumed the position mentioned above. The reflex is induced on the recumbent child, with legs extended, by flexing one on the thigh and on the pelvis, with moderate compression, watching the behavior of the other leg. This foot phenomenon could never be elicited in healthy children, but could be induced at will in both these meningitic children. In others with the disease more advanced the response was negative, confirming that the phenomenon is an earlier sign.

Farmachidis, C. B. LAVAGE OF SPINAL CAVITY IN EPIDEMIC MENINGITIS. [Gaz. d. Ospedali e delle Cliniche, November 13, 1919. J. A. M. A.]

Farmachidis emphasizes the benefit in a case in which he rinsed out the spinal cavity with a 7.5 per thousand physiologic solution, using up to 360 c.c. at each sitting, and keeping this up daily for twenty-five days. He first withdrew 30 c.c. of the spinal fluid and then injected the same amount of the physiologic solution. After a minute or two this was then gently aspirated or allowed to flow out, and 30 c.c. were injected again, repeating this ten or twelve times at a sitting, thoroughly rinsing out the cerebrospinal canal, the fluid finally coming away clear. The procedure is not painful, but injection of antimeningococcus serum causes some pain. By the second application in the case described the fever disappeared, and the young man became conscious, while the procedure seemed harmless. The cerebrospinal fluid was clear by the twenty-third day.

Aubertin reported in 1915 having treated fifty men with three injections of 50 c.c. of the antiserum, preceded by rinsing with a total of 150 c.c. of physiologic solution, and a cure followed.

Rossiter. ENCEPHALITIC LETHARGICA. [New Zealand Med. Jour., June, 1919.]

This is a study of some New Zealand cases. Ten, with three deaths, are recorded. There was relative acuteness in onset, apathy, lethargy or stupor, pathological sleepiness, and absence of spontaneity as the prominent general symptoms. There may be restless delirium with automatic purposeless reproduction of familiar movements, while pseudo-hysterical manifestations alternating with profound hebetude were present in some of the cases. Katatonia was seen in one case, while in nearly all it was noticed that often during most profound lethargy the patient's response to request would, in act and word, be surprisingly accurate and rational, with almost immediate relapse into stupor. Though headache, giddiness and vomiting, Kernig's sign, and pain and stiffness in the neck may be present, they are often not well marked, and the picture is never one typical of an acute meningitis. Among ocular symptoms blurred vision shortly followed by diplopia is generally the first to be noticed, and any degree of ophthalmoplegia, with ptosis, may occur. The pupils may be contracted, dilated, or fixed, or normal, and the patient may have the appearance of ptosis or drowsiness where there is no paralysis, and inability to sustain ocular movements may be the only defect. Involvement of the lower cranial nerves is common, resulting in facial paralysis, with both motor and sensory paralysis of the palate, tongue, larynx, and pharynx. Lumber puncture may prove beneficial if there are marked indications or increased cerebrospinal pressure, but in the absence of severe headache, choked disc, or very extensive ophthalmoplegia its value is doubtful except as a diagnostic measure. Beyond meningeal congestion, and possibly minute patches of localized meningitis, or limited areas of subpial hemorrhagic effusion, there is little to be noted microscopically. On section of the gray and white matter the appearance may be one of general congestion. Beyond careful nursing, and in the absence of increased cerebrospinal pressure, there are no known curative measures, but venesection and free purgation are suggested on the assumption that the condition is one of hyperemia of the bulb.

Roger, H. RELAPSING CACHECTIC CEREBROSPINAL MENINGITIS WITHOUT VENTRICULAR LESIONS; HEMORRHAGIC ENCEPHALITIS OF LEFT FRONTAL LOBE AND THROMBOPHLEBITIS OF THE SUPERIOR LONGITUDINAL SINUS. [Marseilles Medical, July 15, 1919.]

In the slow, cachectic, relapsing form of cerebrospinal meningitis there is a lesion of the ventricle, a meningococcic ependymitis, curable by intraventricular injections of serum. In one case of Roger's, characterized by three relapses and rapid cachexia, lasting only two months,

trephining of the ventricle was not attempted, as neither the clinical signs nor the cerebrospinal fluid indicated pyocephalitis. At autopsy the ventricles were normal, but there was a hemorrhagic encephalitis of the frontal lobe, and thrombophlebitis of the superior longitudinal sinus. Roger believes that the hemorrhagic encephalitis was independent of the thrombophlebitis and due instead to a meningococcic arteritis. Of interest is the tardy appearance of meningococci in the spinal fluid—first appeared on the twenty-first day—and the fact that the intensive serum treatment was apparently discontinued too early. He had given 540 c.c. of serum intraspinally. [Author's abstract.]

Henneberg. A RARE FORM OF BRAIN ABSCESS. [Berl. klin., Woch., July 14, 1919.]

In this report the author records the history of a man, aged twenty, who from infancy had eczema of arms and head. In May, 1918, he was treated in a military hospital for vomiting, the diagnosis being first gastritis, then neurosis. He came under observation July, 1918, with the following: Pain in the back of the head, occasional cervical rigidity, occasional slight giddiness, bouts of vomiting, slight dementia, occasional apathy, inequality of the pupils, diminished reaction to light, optic neuritis, paresis of the abducens (first the left, then the right) muscles, nystagmus, loss of corneal reflexes. The pulse was 60 to 70, on one occasion 48. Wassermann reaction was negative, and lumbar puncture showed neither lymphocytosis nor an increase of albumin. The head was not tender on percussion, and there were no disturbances of speech. But there was paresis of the buccal branch of the right facial nerve, the sense of smell was reduced, and there was slight weakness of the right arm and leg. His movements were a little uncertain when he turned. There was no fever till a short time before death, which occurred in December, 1918. A tumor of the base of the brain was diagnosed, but the necropsy showed extensive multiple abscess formation of the left frontal lobe, starting presumably from the eczematous scalp. Under the scalp covering the right parietal bone there was an old circumscribed abscess. The left frontal bone was much swollen, and in the frontal lobe there were twelve abscesses of various ages and sizes. They formed a conglomeration extending backwards as far as to the central convolution. Some were larger than a walnut, others were as small as a bean. Most of these abscesses were enclosed in thin but firm capsules, to which numerous minute abscesses were adherent. The pus contained numerous staphylococci and diplococci resembling meningococci. There was great edema of the left hemisphere, and a moderate degree of hydrocephalus on the right side. No other foci of suppuration could be found. The author correlates the indefiniteness of the local symptoms with the absence of brain softening, and he notes with emphasis the absence of motor aphasia, although the third frontal convolution was involved. Other curious features of the case were the early development of distant symp-

toms (multiple paresis of the cranial nerves), the absence of aphasic disturbances, the reference of the pain to the back of the head, and the absence of tenderness on percussion over the affected area. None but very early operation could have been of any benefit.

Rivarola, R. A. BRAIN TUMORS IN CHILDREN. [Semana Méd., November 20, 1919, XXVI, No. 47. J. A. M. A.]

Rivarola's article is based on nineteen personal cases and 120 from the literature. He was impressed with the length of the interval in others' cases between the first examination and the diagnosis of the location of the tumor, and the further delay after this before the operation. Except syphilomas, all brain tumors, he declares, should be removed no matter what their nature may be. Lumbar puncture is of no use, and exposes to serious mishaps. Radiography is also no help in the diagnosis, except with tumors of the sella turcica. The tuberculin and Wassermann tests are also useless for determining the nature of the tumor. He suggests that there may be a field here for radium treatment. Tuberculomas form about 50 per cent of the cases of brain tumor in children, while syphilomas form barely 0.3 per cent. The cerebellum is the preferential site of the tumor in children. Brain tumors in children are easily enucleated as a rule. The physiology of the child's brain differs from the adult; certain centers are not yet anatomically formed, and hence the manifestations of their functioning are lacking from the clinical picture of brain tumors as we see it in adults; owing to this, diagnosticians are often misled. The first objective symptoms noticed by the family are very important for the diagnosis, besides the cardinal symptoms, headache, vomiting, constipation and edematous optic disk or optic neuritis. These symptoms combined point to a brain tumor, and the fundus findings are always pathologic. Mercurial treatment may be pushed but no more than two or three weeks should be wasted on it, while the child is being watched for other symptoms. The question then is whether the tumor is in the cerebellum or in one of the seven main areas of the brain. Greater precision is not necessary as the whole of one of these areas is exposed, and it is easy to detect symptoms traceable to such a large zone. The cerebellar, frontal, rolandic, parietal and pedunculocerebellar zones are responsible for fully 80 per cent of all brain tumors in children, and these areas yield the most instructive symptoms. Perhaps this is because these zones are the better irrigated and most active functionally. Hemianopsia along with disturbances in gait, noticed by the parents before occipital symptoms developed, point to the cerebellum, disregarding the occipital manifestations as these are probably due to compression from a distance. If before the general convulsions developed, there were convulsive spasms of the muscles of the neck and shoulders, the frontal lobe should be suspected. If the child complained of its ear along with the intense headache, examine the temporal lobe. More than in surgery elsewhere, an early diagnosis and immediate operation should be the rule. He found

only one case of syphiloma on record. This was in a girl of nine, and necropsy after a year of absolutely ineffectual specific treatment revealed the gumma which could easily have been removed during the eighteen months after the first symptoms.

Marinesco, G. INTRASPINAL TREATMENT OF SYPHILITIC AND PARASYPHILITIC LESIONS OF THE NERVOUS SYSTEM. [*Revue Neurologique*, No. 12, December, 1919.]

The author cites Ehrlich, Stewart, Ballance and Sicard to support his claim as the originator of intraspinal injections of salvarsanized serum *in vivo*. It was in 1910 that Marinesco first thought of this method; consequently he preceded Swift and Ellis in this line of research. Later he collaborated with Minea, and since 1914 they have advocated subdural injections, spinal and cerebral, *in vivo* and *in vitro*, of salvarsanized autogenous serum in the treatment of tabes and paresis. He now produces new evidence, experimental and clinical, of the efficacy of this mode of treatment. Coloring matter injected into the spinal canal, both in man and animals, gradually travel from the site of injection to the upper portion of the central nervous system, staining not only the meninges and perivascular tissues, but also the base of the brain, and later rise to the convexity where they are deposited on the surface of the cerebral convolutions and in the fissures. Five cc. of methylene blue suffices to demonstrate this migration. One may then assume that salvarsanized serum injected into the spinal canal will ultimately reach the surface of the brain and hence exercise a spirolytic action in syphilitic cerebral lesions. Marinesco does not agree with Goldman, who first tried these experiments, that the impermeability of the choroidal plexus is a factor when the coloring matter is injected into the blood stream. Under normal conditions the choroidal plexus retains coloring matter. Marinesco thinks that the explanation lies in the high dilution and the swift motion of the fluid, when injected into the blood stream; whereas in intraspinal injections the coloring matter mingles with a fluid which is at rest, and is thus brought in more intimate contact with the constituent elements of the nervous tissue.

Marinesco has treated fourteen new cases of progressive general paralysis and of tabes, and has had them under observation for five and six years. His treatment has produced modifications of the biological reactions, the Wassermann becoming fainter and finally negative, the globuline reactions diminish in intensity, and the lymphocyte count is lowered. The mental state and clinical symptoms improve, and to measure the advance made he resorts to Ebbinghaus' and Heilbronner's procedure, in order to have a standard of comparison. Without discounting the action of the neosalvarsan contained in the serum the author attributes the action of the salvarsanized serum *in vivo* to the presence of antibodies. There may possibly be an intermediary agent between the antigen and the antibody. But whatever the hypothesis of the mechanism, the

curative action is indisputable, as not only the personal observations of the author indicate, but also those of a great number of competent investigators in America, first and foremost Swift and Ellis, who, while having no priority claim, have nevertheless confirmed by numerous observations the results published by the author in the beginning of 1911. Marinesco firmly believes that with the introduction of salvarsanized serum the question of the cure of syphilitic and so-called parasymphilitic lesions of the central nervous system enters upon a new phase. However, in order to obtain a partial cure, or even manifest improvement, it is necessary to select the cases, and institute treatment from the onset. He uses the following technique: Cases with cardiac or renal complications, or with epileptiform attacks, are ruled out. A few hours, to three days, after an intraspinal injection of 75 to 90 centigrammes of neosalvarsan, 30 gr. of blood is withdrawn and placed in a refrigerator over night without centrifuging. The coagulum is then removed and the serum, amounting to 10 to 15 gr., is inactivated and then injected into the spinal canal. To avoid compression symptoms an equal amount of the cerebrospinal fluid is first withdrawn. [Author's abstract.]

Barbé, A. THE NERVOUS SYNDROME OF THE INFRA-MASTOID REGION. [*Progrès Médical*, 1919, July 19, p. 281.]

A soldier was wounded in the left infra-mastoid region by a fragment of shell. There were signs of injury of the left glossopharyngeal and spinal accessory nerves and also of the posterior branches of the left superficial cervical plexus; there was slight involvement of the cervical sympathetic, but the vagus nerve escaped injury. Three months later the wound was healed, but there was persistent painful stiffness of the sternomastoid and trapezius muscles and pain over the left scapular region. Physiotherapy failed. Six months after the injury Barbé was consulted. Signs of glossopharyngeus palsy were present, with slight difficulty in swallowing. There was anæsthesia in the distribution of the posterior branches of the left superficial cervical plexus, also on the left half of pharynx, left tonsil, and left posterior and anterior faucial pillars. The case seems to show that the sensory area of the glossopharyngeal nerve extends as far forward as the anterior pillar of the fauces. [Leonard J. Kidd.]

Laignel-Lavastine. TWO CASES OF RAYMOND'S SYNDROME OF SOFTENING OF THE CORPUS CALLOSUM. [*Bull. de l'Acad. de Méd.*, 1919, June 17, p. 817.]

In Raymond's corpus callosum syndrome there is at the onset a want of connection between ideas, a strangeness of behavior, and disturbances of memory, recent events being quickly forgotten. Memory for places may be defective, and there is a profound change of character, the patient becomes irritable, his mood varies and changes, and sometimes he is unconscious. Affective feelings are preserved. The writer's first case

was a man of forty who, after a stroke followed by hemiplegia, had psychical symptoms like those of general paralysis: he had grandiose delusions, failed to recognize his bed, and wandered from hospital. He was disorientated in space and did not know what he was doing. Great defect of memory for recent events, but not for old. Very rapid fatigue of attention. Speech slow and jerky. Death two months later by a second stroke. Necropsy showed a hemorrhage of the right antero-internal part of the right hemisphere bursting into the lateral ventricle. There was a softening of the corpus callosum from its genu backward.

The second case was a woman of fifty who was arrested whilst wandering on the highway. She showed mental blurring, mutism, and right hemiparesis. After a few days the mental dullness disappeared and gave way to a euphoria with slowness of ideation, amnesia for recent events, word-deafness, dysarthria, and right hemiparesis. The euphoric state persisted, with stationary amnesia and some difficulty of speech. Death from erysipelas four months after onset. Necropsy showed softening of the genu of the callosum, and a second focus of softening beneath the hinder part of the left first temporal convolution.

The writer points out that in corpus callosum lesions one nearly always thinks of the possibility of general paralysis of the insane. The disturbances of intelligence are to be correlated with the fact that the callosum is a great association-path between the two hemispheres. A proper anatomical and physiological connection between the hemispheres is essential to the preservation of normal intelligence. [Leonard J. Kidd.]

Haden, R. L. THE CEREBRAL COMPLICATIONS OF MUMPS. [Arch. of Internal Med., 1919, XXIII, June, p. 736.]

Although mumps is usually harmless, it has been known for over a century that death may occur from involvement of the central nervous system. Before the days of lumbar puncture the lesion was regarded as a meningism. But, with the demonstration of a pleocytosis of the spinal fluid, a meningitis was held responsible. Haden, however, claims that the fundamental condition is an encephalitis, for in most cases the cerebral symptoms are out of all proportion to the meningeal reaction revealed by the spinal fluid. The common symptoms are high fever, headache, nausea, and vomiting. Usually there is only slight nuchal rigidity, and Kernig's sign is only slightly marked. "Numerous cases occur of undoubted involvement of the cerebrum alone," as in cases 6 and 9 out of the writer's nine recorded cases. Among the symptoms noted in the 31 cases reported by Acker were unilateral convulsions, monoplegia, hemiplegia, aphasia, speech disturbances, psychosis, sensory disturbances, and stupor. The other predominant symptoms, such as bradycardia, headache, vomiting, and papillœdema are probably directly due to the increased intracranial pressure. Necropsies (few in number) have shown great cerebral congestion with only a serous meningitis. As

a rule, diagnosis is easy. In Haden's first case tubercular meningitis was considered because the symptoms suggesting meningitis appeared before the submaxillary swelling was recognized. In one of his cases Gram-positive cocci were demonstrated in the spinal fluid. Animal inoculation and culture were negative. Lumbar puncture proved a most effectual therapeutic measure: the temperature usually falls to normal quickly, and the headache is relieved by the withdrawal of fluid. [Leonard J. Kidd.]

Egger, Max. PARALYSIS OF CENTRIPETAL CONTRACTION. A NEW CONCEPTION OF HEMIPLEGIA. [Schweizer Archiv f. Neurol. u. Psychiat., Vol. III, No. 1, p. 3.]

The fact that individuals affected with hemiplegia gradually regain the power of using the lower limb for walking and for movements connected therewith, while voluntary movements are just as little possible as with the upper extremity, is in contradiction with the classical theory of the rôle of pyramidal fasciculi. From his own observations and from the communications of v. Monakow, the author comes to the conclusion that the degeneration of the pyramidal fasciculi does not destroy the power of centrifugal contractions, *i.e.*, the static and kinetic movements for carrying the leg from the oblique position in advance of the body across the perpendicular to the oblique position to the rear of the body, but only paralyzes the centripetal contraction—that is to say the pyramidal fasciculi seems to control only the voluntary movements. [J.]

Wise, Walter D. HEMIPLEGIA — SPONTANEOUS AND TRAUMATIC. [Modern Med., March, 1920.]

The author calls attention to the fact that not infrequently one sees a patient in coma with a hemiplegia in whom there is a history or evidence of trauma. "The task of the surgeon in this class of cases is to determine the nature and location of the lesion, and whether it is a cause of the trauma or a result; that is, whether the case presents an apoplexy in the usual sense, thrombosis or embolism, or intracranial damage as the result of injury."

Typical cases are quoted as follows:

"A workman, age forty, engaged in repairing the top of a car, fell to the ground and was rushed to the hospital in a deep coma. Examination showed no injury to the head, a few body bruises, and a complete hemiplegia. A diagnosis of apoplexy was confirmed at autopsy."

"A painter, aged thirty, fell from a scaffold (the scaffold did not fall) and was brought to the hospital unconscious with a hemiplegia. Examination revealed a slight abrasion and bruise on scalp. A diagnosis was made of probable apoplexy, but the motor region was explored. No evidence of extra or subdural injury was found."

"C. M., age thirty-eight—probably a case of embolism—occurring while the patient was driving a wagon, causing him to drive into a ditch

and be thrown out. Examination showed paralysis of the right side of his face and arm and a partial paralysis of the leg."

Other types of hemiplegia, which are somewhat rare and confusing are spoken of—as those caused by localized traumatic edema and subdural hemorrhage and the edemas that occur in nephritis. Brown-Séguard's paralysis due to injury and associated with cerebral trauma, produces a most confusing picture. "There is, as a rule, no reason to confuse typical cases of apoplexy, embolism, thrombosis, or spontaneous hemorrhage in tumors with trauma, and in a large percentage of traumatic cases the symptoms and signs are plainly the result of injury. There is, however, a small group in which it is most difficult or impossible to make a differential diagnosis. Frequently there is great urgency to make a decision; no history can be obtained from the individual or witnesses, and there is not time for a prolonged investigation.

"If there were witnesses, their account of the fall, accident, or seizure is of the greatest importance; the evidence of persons seeing the patient a short time before, or a short time after the accident, may be of great value.

"The presence or absence of the results of trauma, such as contusions of the scalp, bleeding from the nose, ear, or mouth, should have great weight in forming an opinion.

"If there is a history of a fall without apparent cause, particularly in an elderly individual with arteriosclerosis, followed by immediate complete hemiplegia and no evidence of severe trauma to the head, it is probably apoplexy. The hemiplegia being incomplete does not, however, mean the lesion is not in the internal capsule, as this whole structure is not necessarily involved in the apoplexy that occurs so frequently from hemorrhage in that region.

"A blow on the head, momentary unconsciousness, a lucid interval, slowly developing paralysis beginning with the face, then the arm, then the leg, is almost surely an extradural clot; but examples of a complete hemiplegia from this cause are not often encountered."

To determine at autopsy whether a hemiplegia is spontaneous or traumatic there must be a consideration of the presence or absence of general disease of the blood vessels and heart or kidneys. Spontaneous hemorrhages are nearly always central only. In traumatic central apoplexies meningeal hemorrhages are almost universally present also. [Author's abstract.]

Rosenblath. ORIGIN OF HEMORRHAGES IN THE BRAIN IN APOPLECTIC SEIZURES. [*Deutsche Ztschr. f. Nervenhe.*, 1918, Vol. LXI, p. 10.]

Among all the theories which medical science advances concerning the origin of diseases apparently one of the simplest is that concerning the origin of brain hemorrhage in apoplectic seizures. It is assumed that a brain artery suddenly bursts and that the blood flows out under a certain pressure, destroying the adjacent tissue. In the author's opinion,

however, this mechanical theory is not sufficient to explain the destruction which occurs in apoplexy. Even the form of the apoplectic foci cannot be considered as exclusively due to a mechanical cause without doing violence to the facts. And very little brain tissue is found which has sustained mechanical injury. The small or infinitesimal bleedings which are found in the vicinity of the extensive focus are of essentially the same character as the focus itself. In the vessels in their inner parts as well as in the nervous tissue, necrotic processes are discernible. Within the large apoplectic foci a great part of the tissue, *i.e.*, the nerve fibers and cells and the glia and vessel systems are destroyed or undergo a transformation whereby they become of fluid consistency and at last lose their proper morphological character. Of the vessels only a few arteries are preserved, these being usually those which have thick walls or are sclerotic. At the point where the blood outflow takes place the dead arteries are most visible. The so-called miliary aneurisms are a secondary form which the dead vessels may assume. The necrotic arteries are often obstructed by thrombi. It is to be assumed that the hemorrhages originate principally from the dead capillaries and veins. [J.]

Strümpell, Adolf. STEREOGNOSIS BY MEANS OF THE TACTILE SENSE AND ITS DISTURBANCES. [Deutsche Ztschr. f. Nervenh., Vol. LX, p. 154.]

Stereognosis is dependent on preservation of muscle sense, of sense of pressure and sense of place. The confusion in the astereognosis question began with the well-known treatise of Wernicke in 1895. He regarded astereognosis as the result of a "loss of the memory pictures of the sensations of concrete objects, localized in the posterior central convolution." In the author's opinion both Wernicke's cases of "touch blindness" were only simple astereognosis as a result of disturbance of deep sensibility and Wernicke's entire theory of "touch blindness" is built on an error arising from incomplete observation." The value of Wernicke's observation does not consist in having proved a touch agnosia in analogy with mind blindness and word blindness, but in having for the first time established the fact that astereognosis results from a disease of the cerebrum and, precisely, of the posterior central convolution. The cause of this astereognosis, however, lies in the circumstance that in disease at this localization the part of the brain is destroyed which receives those sensory impressions which permit judgments of the form and size of objects to be made from the sense of deep pressure, the muscle sense (sense of the position of the finger and of the direction and scope of movement). Describing two clinical observations of disease of the brain cortex which caused disturbances of sense of tactile localization, the author asserts that they cannot be interpreted as tactile agnosia in Wernicke's sense, but are the result of disturbances of special cortical centers of sensibility. The author does not deny the possibility of the occurrence

of a true tactile agnosia, but asserts that it must be very rare. Dejerine questions the existence of this disturbance. In conclusion a case is described where disease of the peripheral nerves injured electively just those sensory neurones, the normal functioning of which are necessary for stereognosis. [J.]

Forel, O. L. CEREBRAL TRAUMATISMS. [Schweizer Archiv f. Neurol. u. Psychiat., 1919, Vol. IV, No. 1, p. 170.]

Recognizing the fact that chemical anesthesia is always dangerous and sometimes fatal, the author undertook experiments to determine whether a state resembling fainting or post traumatic unconsciousness could be produced, in which operations might be performed. As unconsciousness of this character is a functional disturbance, the same danger would not be attached to it. According to accepted explanations, unconsciousness from shock is caused by a cone of depression of the brain or spinal fluid at the point of concussion and a point of stress at the extremity opposite to the axis of concussion. The bony substance being unyielding and the brain substance being incompressible, there results a displacement of the inner content with consequent vibrations reaching the cerebral and spinal centers. Attempts to bring about the same phenomena in animals by means of oscillations back and forth were entirely without result, but the experiment was then modified to make use of the effect of centrifugalization so that there would be a compression of the cerebral cortex against the internal face of the skull. The head (and with it necessarily the body) were turned about their vertical axis with the result that phenomena were produced in both man and animals resembling functional unconsciousness to such an extent that the author believes continued experiments along the same line will attain the desired result. [J.]

Rosenheck, Chas., and Groeschel, L. B. EXTENSIVE DESTRUCTION OF THE SELLA TURCICA WITHOUT CLINICAL SYMPTOMS. [N. Y. Med. Jour., March, 1920.]

The authors present the history, clinical and radiographic data of a hypophyseal neoplasm which produced extensive destruction of the sella turcica, and which, to date of the report, has produced no subjective disturbance; nor was it possible to demonstrate abnormal phenomena in the sensori-motor mechanism. The patient, who was an analytical chemist, sixty years of age, of keen intelligence, came under observation for a diagnostic study, not with a view of correcting any existing abnormality but on account of his age, to determine the status of his physical organs. Roentgen plates of the skull taken for the purpose of determining the condition of the sinuses and teeth revealed these to be in a normal condition. The sella turcica, however, revealed a wholly unsuspected pathology. The anterior clinoid processes were partially destroyed, there was complete destruction of the dorsum sella and floor and partial

destruction of the wall of the sphenoid sinus. These findings were confirmed by several Roentgenologists of wide experience, who concurred in the opinion that a cystic growth, having its origin in the hypophysis cerebri, was responsible for the destructive process. In view of these findings an exhaustive neurologic study was undertaken to determine the degree of disturbance present in the neural axis. This study yielded absolutely negative results. Nor was it possible to elicit any subjective complaint on the part of the patient who insisted on a general sense of well-being. The authors comment on the fact that grave intracranial processes have been known to exist for months or years without giving rise to demonstrable subjective or objective phenomena. Cushing is quoted, who explains this anomaly by the fact that so-called "silent" areas of the brain are invaded. Thus no abnormal signs or symptoms are manifest. To consider the sella turcica and its contents as "silent" areas in view of the well established syndromes which disease processes in this region produce, would hardly be justified. The fact remains, however, that this area in the patient under discussion, in spite of a rich pathology (so graphically portrayed by the X-ray) is indeed "silent." The cystic nature of the mass, which the surrounding brain structures have acquired a tolerance for, is adduced as a possible explanation for the absence of abnormal phenomena. There is compression without destruction. Hence neural pathways are not compromised. The absence of acromegalic phenomena is explained (theoretically, at least) by the possibility that other endocrine organs take up the functions of a disabled or a destroyed member of the endocrine chain. [Author's abstract.]

Houckgeest, A. Q. van B. A RARE CASE OF CEREBRAL HEMORRHAGE. [Nederl. Tijdschr. v. Geneeskunde, 1919, August 2, p. 343.]

The writer records a case of what was probably primary ventricular hemorrhage. A woman, who was excited about the homecoming of her son, became suddenly comatose one morning. Seven years previously she had had a somewhat similar seizure, but without unconsciousness; she had then left hemiplegia. For a year before the present attack she had become forgetful. Examination shows head deviated to right, but not the eyes; right angle of mouth lower than left. Pulse full and tense. Left pupil \gt R. She has plus tendon-jerks, L \gt R. Left arm spastic. Once bilateral Babinski was observed. Left leg spastic. Lumber puncture gave a fluid under slight pressure, flowing by drops, dark yellow and turbid. A week later, head held to right as before, right eye slightly deviated to right; pupils now contracted. Death without return to consciousness. Necropsy (cranial cavity only): thickening of dura and vault; pia very hyperæmic, turbid in places. Behind chiasma there are blood clots; no opening found in vessels at base of brain. Ventricles not definitely dilated, but all contain blood clots. No tumor found, nor any bleeding into the brain tissue which had burst through into the ventricles. The cerebrospinal fluid had a negative Wassermann; its dark yellow

color was due to xanthochromia, and it contained fresh red blood corpuscles. Houckgeest suggests that as neither a hemorrhage into the brain tissue itself, nor a neoplasm was found, we might here be dealing with a case of primary ventricular hemorrhage: "Possibly the bleeding arose after the bursting of a small aneurysm of the tela choroidea, but this was not found." Probably the blood effused into the fourth ventricle had pressed more on the right half of the pons, hence the right facial paresis and the left-sided spasticity. [Leonard J. Kidd, London, England.]

Brouwer, B. INFANTILE SPASTIC HEMIPLEGIA. [Proc. 16th Netherlands Physical and Med. Congress, Sect. 3, 1917, p. 538. (12 figs.).]

Brouwer records a case of infantile spastic hemiplegia in which microscopical examination showed very little change in the pyramidal path. A man, forty-nine, had, when three years old, an acute attack with convulsions, followed by left hemiplegia, epileptic attacks, and ultimately imbecility. The right cerebral hemisphere was much the smaller, and showed extensive microgyria; and the left side of the cerebellum was a trifle smaller than the right. The gyrus centralis anterior was well preserved, and there was but little difference in size between the right and left pyramidal paths. The degree of involvement of the right motor tract did not correspond with the degree of the paralysis. The association system had suffered severely. The right frontal pole was almost wholly destroyed, and so was its cortex, except on its medial parts which belong to the lobus cinguli. The corpus callosum was almost wholly degenerated. The striatum is smaller than on sound side. Centrum ovale is absorbed, and replaced by a secondary hydrocephalus. Uncus normal. Operculum and the cortex of the first frontal convolution is destroyed. The insular cortex is normal. First, second, and third temporal convolutions are small. The internal capsule is reduced to a few fiber-bundles. The lobus paracentralis and the dorsal parts of the gyrus centralis anterior have a well-formed cortex and many preserved fibers. The ventral part of the gyrus centralis anterior is wholly destroyed. The fasciculus longitudinalis inferior is spared, and is abnormally sharply marked off from its surroundings. The cornu Ammonis and the gyrus hippocampi are almost entirely normal. The caudate and lenticular nuclei are normal: so is the formix. The thalamus has lost most of the cells of its anterior nucleus, and those of its lateral nucleus are entirely replaced by glial masses; its other nuclei and also the external geniculate body are normal: the latter is, however, a trifle small. The optic radiations are normal. The internal geniculate body is much smaller than the external, but many of its cells are preserved. In the parietal region the pulvinar is much altered; and the lobus cinguli, lobus paracentralis, and lobus parietalis superior are small, but are not destroyed, whereas the lobus supramarginalis is. The stratum sagittale internum is present, the tapetum absent. The regio retro-splenialis and

the gyrus hippocampi are strikingly spared. So also is the calcarine region; but the medullary substance and the cuneus and the lateral occipital convolutions are small, and microgyria is present here and there. There is no important secondary degeneration of the pyramidal tract. But there is diminution in size of the right pons, tegmentum, and bulb. No cortical cerebellar changes. From his survey of his findings, and from a review of the comparative anatomy of the cerebrum, Brouwer points out that in his case the phylogenetically younger parts of the brain had offered less resistance to the morbid process than the phylogenetically older parts had done. [Leonard J. Kidd, London, England.]

Howe, H. S. ANEURISM IN THE POSTERIOR CRANIAL FOSSA. [Neurological Bulletin, September, 1919, Vol. II, No. 9, p. 323.]

The case recorded is that of a nurse, aged fifty-three, who had no illness until the onset of her present trouble in June, 1915. As she was preparing for bed she felt a slight momentary tremor in the right side of her tongue. A day later a similar spasm occurred, also two days later and four days later. The next day, three occurred. Seven days after the onset she noticed that she was unable to move her tongue as formerly and that it protruded to the right. Swallowing was difficult. She had attacks of coughing and choking and occasionally food regurgitated through the nose. About a week after the onset she began to lose her voice for periods of about four or five hours during which she could not speak above a whisper. This condition continued for nearly a year when she lost her voice entirely and has never been able to speak louder than a whisper since. Two months after onset she noticed a noise in the right ear which seemed like a "distant pumping machine." This was constantly present and gradually became louder until it sounded like "escaping steam." Later it became still louder and was likened to "terrific rhythmic pounding." Two months after onset of tinnitus she became absolutely deaf in the right ear. In August, 1915, she was under observation at the Neurological Institute with a tentative diagnosis of syphilitic meningitis, but as lumbar puncture and Wassermann were entirely negative she was discharged without a definite diagnosis. In November she consulted Dr. Cushing in Boston who advised hysterectomy for removal of a fibroid but gave no diagnosis as to the cause of her cranial nerve palsies. He expressed the opinion, however, that the condition was stationary and would not progress. All symptoms remained stationary until June, 1918, when the entire right side of the face suddenly became paralyzed. In May, 1919, she suddenly developed a stiffness in the right side and back of her neck, and an area of exquisite burning pain at the base of the skull to the right of the midline. From this time until the time of writing there had been almost constant tonic-spasm of the muscles of the right side and back of the neck, which was so severe that she was unable to turn her head to the right. These spasms were accompanied by agonizing pain. Previous to the onset of

this pain she had noticed an atrophy of some of the muscles in the right side of the neck; and subsequent to its onset she had attacks of vomiting nearly every day when the pain was most extreme. During the two weeks before the time of writing the pain had been much less severe and there had been practically no vomiting attacks.

The neurological findings were entirely confined to the cranial nerves. There was complete paralysis of the right side of the face, absolute deafness in the right ear, absence of secretion of tears in the right eye and diminished secretion of saliva in the right portion of the mouth. There was probably involvement of the right vagus, causing difficulty in phonation and in swallowing. The right spinal accessory was affected as was shown by atrophy of the right sternomastoid and superior fibers of the right trapezius. There was complete paralysis of the right hypoglossus nerve, the tongue protruding markedly to the right with atrophy of this half of the tongue. Auscultation over the right mastoid process disclosed a loud blowing murmur which was synchronous with the heart beat. It was loudest at this point but transmitted down the neck along the line of the carotid vessels for a distance of about two inches. Compression of the carotid artery against the carotid tubercle caused the murmur to disappear.

The diagnosis of intracranial aneurism seemed reasonably certain on consideration of the clinical history and neurological findings. The history was that of irritation and later paralysis of the right twelfth, eighth and eleventh nerves, with paralysis of the seventh and involvement of the tenth on the same side. These lesions could conceivably have been produced by a new growth, a basilar meningitis or an aneurism of the vertebral arteries. It did not seem probable that a new growth of four years duration in this locality could produce this group of findings without also causing compression of the medulla or cerebellum and signs of increased intracranial pressure. Basilar meningitis was not likely in view of the negative serological findings. The murmur, while not pathognomonic, was considered evidence in favor of an aneurism; and taken in conjunction with the other findings it seemed probable that there was an aneurism of the right vertebral artery originating at the junction of this vessel with its largest branch, the posterior inferior cerebellar. [Author's abstract.]

Klessens, J. J. H. M. ABSCESS IN LEFT HEMISPHERE, IN A RIGHT OTITIS MEDIA. [*Nederland. Tijdschr. v. Geneeskunde*, 1920, LXIV, p. 1269.]

Patient had migrainous vomiting attacks for many years, but was never seriously ill. Recently right otorrhœa and otalgia. Then, paresis of right facial nerve, with gradually increasing mental dullness; no pyrexia; pulse rather slow. Right tympanic membrane red, and retinal veins slightly dilated. Motor and partial sensory aphasia. Somnolence. Possibly slight weakness of right arm. Right Babinski sign. Slight

blunting to prick over whole right side. Right facial defensive reflex of Wernicke absent. Normal pupillary and corneal reflexes. No Jacksonian fits. At first a primary, deeply-seated thrombosis was diagnosed. After three days the right-sided paresis was definite, and there were choked discs. Temperature still normal, but general state deteriorating, greater somnolence, and slow pulse. A subcortical abscess was now suspected. Six days after admission, the left facial cortical center was freely opened; the convolutions were flattened, and were under great pressure. At the second puncture a deep abscess was evacuated; the pus contained no bacteria. But the patient died from pneumonia, due to food entering the air passages, two days after operation. Klessens thinks that probably a chronic otitis existed long before the abscess appeared. Diagnosis was difficult. The cause of the abscess is obscure. Its formation on the opposite side from the otitis is noteworthy. [Leonard J. Kidd, London, England.]

Guttman, J. OTITIC CEREBRAL ABSCESS. [The Laryngoscope, October, 1919, p. 581.]

The author records a case of otitic abscess of the temporal lobe in a man aged thirty-five who had had an aural discharge for sixteen years. The patient came to hospital on July 14, 1918, complaining of severe headache and vomiting which his family doctor ascribed to gastritis. On examination Guttman found foul-smelling pus in the ear with soft red granulations protruding from the upper and hinder wall of the tympanic cavity. Hearing V-1 h-0. The caloric test showed a functioning labyrinth. Evidently the granulations were not attached to the labyrinthine wall. Some of them were removed easily without pain; this gave great relief for three days. Then the temperature rose to 103° , with severe headache and drowsiness. Radical mastoidectomy was done. Two ounces of offensive pus were evacuated. Next day, temperature was 99° , with less drowsiness; on the following day the sensorium was less clear, and Babinski's, Kernig's, and Brudzinsky's signs were present. The cerebrospinal fluid was under great pressure and showed evidence of meningitis. On July 22nd (four days after admission) the temperature rose to 100.1° , and the sensorium was clouded. Next day the wound was reopened, and the dura was found bulging but not pulsating. Accordingly the lower gyrus of the temporal lobe was explored. Two ounces of "cadaverous" smelling pus was evacuated from a cavity the size of a small orange. Decomposed brain tissue came away with the pus. During this exploration breathing stopped; it returned, but only after a considerable amount of artificial respiration. Six hours later temperature rose to 105° and the patient died. Guttman thinks that in this case cholesteatomatous masses broke through the tegmen tympani or dutri, forming a chronic brain abscess. This was quiescent and, as it produced no symptoms, the patient did not seek relief until the abscess caused meningeal irritation. The removal of polyps from the ear, even when they are not

attached to the labyrinthine capsule, may flare up a slumbering meningitis. The stoppage of breathing during the exploration was due to temporary interference with the circulation in the medulla, probably from the sudden change in intracranial pressure after the evacuation of the pus from the cerebral abscess. [Leonard J. Kidd.]

Knapp, A. ECHINOCOCCUS OF THE LEFT TEMPORAL LOBE. [Deutsche Zeitschr. f. Nervenhe., Vol. LX, p. 213.]

In a woman fifty-eight years of age who was suffering from arterio-sclerotic disturbances prolonged headache made its appearance, followed by symptoms of excitement, and disturbances of speech which rendered necessary her confinement in an institution. Here she was restless, refused food, understanding of speech was disturbed as well as spontaneous speech, and there was alexia, agraphia, and some apraxia. All these disturbances in the psychic sphere, as well as the physical symptoms were subject to great variations. There were choreatic twitchings in the right hand, attacks of Jacksonian epilepsy in the entire right side, followed finally by general epileptic convulsions. The eye muscle phenomena were remarkable—recurring transitory ptosis on the right side, transitory mydriasis, transitory paralysis of the abducens on the same side. At times cerebellum symptoms made their appearance—stumbling gait, inclination of body toward the right. The symptoms indicating affections of the pyramidal paths, exaggerations of the right knee phenomenon, foot clonus of the right side, Babinski and Oppenheim, were constant. Peculiar attacks of general hypotony, constant headache, bilateral choked disks with amaurosis. The diagnosis was circumscribed disease of the lower parts of the left temporal lobe. Five months after the beginning of the disease a brain puncture was made one centimeter above the left ear. A yellow fluid flowed out containing bubbles in which were found echinococcus scolices with small hooks. Repetition of the puncture caused the symptoms to recede. The patient was operated on and under the cortex of the left temporal lobe was found a cavity as large as a hen's egg, the outer walls of which consisted of brain cortex, four or five inches thick, while the deeper part, after the ragged and inter-rolled layers of echinococcus bubbles were removed, presented the appearance of normal medullary substance. The cavity had extended toward the central convolutions and the occipital lobe, but had not broken through into the ventricle. The patient stood the operation well and soon recovered sufficiently to be returned to the care of her family. [J.]

Hassin, George B. HISTOPATHOLOGY OF BRAIN ABSCESS: WITH REMARKS ON INTRASPINAL THERAPY. [Am. Archives of Neurology and Psychiatry, III: 616, 1920.]

The results of histopathologic studies of four new cases of brain abscess are recorded, together with a brief summary of two cases reported elsewhere. The histologic changes in a brain abscess vary according to

the type of the latter. Acute abscesses rupturing into the brain tissue and not walled off by a connective tissue membrane usually show destructive changes in the brain elements (ganglion and glia cells, nerve fibers and vessels). The ganglion cells are either totally destroyed or are in various stages of acute and severe cell disease. The glia is frequently represented by proliferated glia nuclei and a few amœboid glia cells; the vessels are engorged, thrombosed and often infiltrated. The brain tissue remotely situated from the affected area shows signs of nonsuppurative encephalitis. In case capsule forms around the abscess, the surrounding brain tissue is not damaged. Only the vessels, especially in the neighborhood of the capsule, are infiltrated with fat globules which fill the perivascular spaces of Virchow-Robin. The capsule itself, whether young or old, shows three distinct layers of connective tissue. The outer and inner layers are fully organized, the middle less so, containing a great many young vessels and gitter cells filled with fat. The pia arachnoid shows no signs of inflammation or hyperplasia of its fibers, but its meshes are much distended and packed with lymphocytes, polyblasts, macrophages and gitter cells. The same elements can be found in the perivascular spaces of many blood vessels of the brain tissue, being totally foreign to a healthy or normal pia. Evidently these pathologic elements reached the subarachnoid space from the cerebral vessels, their infiltrated perivascular spaces. Such pathologic findings seem to confirm the work of Key-Retzius, Weed and others that the flow of the cerebrospinal fluid is not from the subarachnoid space of the brain to the latter, but in the opposition direction. If such be the case, then the filling up of the subarachnoid space with a solution of arsphenamin has no physiologic support, as it will not reach the brain. This contention is illustrated by a photomicrograph from a case of acute cerebrospinal meningitis. It shows the subarachnoid space packed with pus cells separated from the brain tissue by a thinly infiltrated pia (plasma cells), while the adjacent parenchyme (cerebellum) is totally free from any pus cell, in fact is perfectly normal. [Author's abstract.]

de Gorsse, B. RIGHT OTOGENIC SUBPERIOSTEAL TEMPORAL ABSCESS FOLLOWED BY METASTATIC ABSCESES OF THE LEFT CENTRUM OVALE AND LATERAL VENTRICLE. [Rev. de Laryngol., Otol., e. d. Rhinol., 1919, XL, p. 659.]

A dragoon, aged nineteen, was admitted with discharge from his right ear which he said followed on antityphoid vaccination five days previously. The diagnosis was suppurative otitis media. On trephining, mastoid and antrum normal. There was a subperiosteal abscess of Luc, but it differed from his description in that the œdema was especially retroauricular and not subauricular, by the presence of rather abundant otorrhœa, and by a temperature of 41° C. with a bad general state. In a few days the local condition improved, but he had headaches, slight vertigo, slight pyrexia, and sometimes a sensation of emptiness in his head. In about seven weeks' time symptoms called "meningism"

appeared, with photophobia, slight nuchal stiffness and Kernig's sign, slow pulse, and a vague deep pain in left temporo-mastoid region. During the next five days vomiting, dilated pupils, increasing slowness of pulse, and aggravation of general symptoms. On the fifth evening coma, and death in half an hour. On necropsy, no surface lesion of brain. On the right side (the side of the ear trouble) no lesion whatever was found: the temporal abscess of Luc had healed perfectly. But on the left side, on which he had had the deep temporo-mastoid pains, there was a softening of the whole lower aspect of the temporal lobe which was adherent to the temporal fossa, especially at the foramina ovale and rotundum; at this point there were tracks of pus which ensheathed the maxillary and mandibular nerves. The left centrum ovale was purulent, and the anterior part of the left temporal lobe also. There was a circumscribed abscess of the temporal horn of the left lateral ventricle. The left auditory apparatus was normal. The peribulbar cerebrospinal fluid was a little muddy; there were seropurulent tracks around the vascular sheaths of the bulbar meninges. Dropsy of the frontal horn of the right lateral ventricle; its fluid was muddy. No other brain lesions. The case, then, was one of death from encephalitis of the left temporal lobe, the late crossed metastatic complication of a phlegmonous periostitis of the right temporal region following on a right otitis media. [Leonard J. Kidd, London, England.]

III. SYMBOLIC NEUROLOGY.

1. PSYCHOLOGY — NEUROSES — PSYCHONEUROSES — PSYCHO-ANALYSIS.

Hollós, Stephan. PHASES OF CONSCIOUSNESS OF SELF. [Internat. Zeitschrift f. a. Psychoanalyse, 1919, V, No. 2.]

Consciousness, according to Freud's view, is an organ for the perception of objective stimuli and of a part of the processes of thought. There are, as it were, two surfaces, the one directed toward external things and the other toward the foreconscious. Hollós states that the question immediately arises: what is the relation in which these two processes stand to each other—are they successive, coexistent, or have they some other relation? By examining what takes place when interruptions of trains of thought occur, *e.g.*, when a train of inward thought is broken off by objective sense stimuli, which in turn give rise to new trains of association, the author deduces a law of alternating phases of inner and outer perception in which the single phases stand in inverse proportion to each other; the stronger the outer, the weaker the inner, and vice versa. The optimum of clearness of consciousness presupposes the highest capacity for energizing both of the receptional surfaces. Further, when memories are revived in the foreconscious it is a member at the beginning and one at the end of the train of associations which is most easily seized; between these extremes there are elements which can

only be revived with difficulty, if at all. Thus beside the phase of inner and outer perception there must be assumed a phase of diminishing consciousness, a sphere into which some of the foreconscious links gradually withdraw and come to form part of the unconscious. Indeed the unconscious phase of associations seems from this almost a regular and necessary result of the normal processes of perception.

The optimum of consciousness may be weakened in manifold ways. For instance the perception of external stimuli is rendered difficult when the backward running process of energizing association trains set in. The outer perception loses its quality of becoming conscious in proportion to the strength and duration of the retrogressive energy; the continuity of consciousness may, in this way, be interrupted and the consciousness of self entirely lost; for it is on the inflowing forces of the external world that the contrasting consciousness of self really depends. Though unconscious phases constantly occur under normal conditions they pass unnoticed because they are of but momentary duration and there seems to be no break, just as in a rapidly rotating surface a hole is unnoticed.

The external sense stimuli on the one hand, and the affects of pleasure and pain on the other, prevent the retrogressive movement from going too far or lasting too long; affective cravings seek satisfaction in the motor paths and the idea of a goal given by the reality principle seeks actualization in the same manner so that there is a constant tendency to keep awake and not to get out of touch with the external stimuli. Associated with these processes is the regulative factor of the endopsychic censor whose constant effort it is to repress into the unconscious certain elements of the association trains and to uphold the idea of a purpose in keeping with the reality principle as offered by the foreconscious.

In the foreconscious two different energies constantly strive for dominance, the one tending toward reality, the other toward the unconscious pleasure principle—that is, to the opposite poles of the psyche. The consciousness of self is an instrument reacting most delicately to every disturbance of equilibrium in the fluent relations existing between inner and outer perception. When the equilibrium is to any great degree destroyed in either direction, the idea of the real and actual is lost, the pleasure principle gains dominance. In measure with the seriousness of the disturbance of equilibrium the resulting state is more or less grave, from conscious phantasies or day dreams to extreme pathological regressive conditions, such as the stupor of katatonia or the deep depressions. When the equilibrium is disturbed in the other direction the result is mania.

To these conclusions the author was led, not by speculation or the principles of psychoanalysis, but through experiments made by him some years ago, on the psychical and psychiatric significance of eye motions. The perception of external stimuli is invariably accompanied by convergence and fixation. At the moment when attention is withdrawn from the object the convergence of the eye is relaxed and there is fixation at a

more distant and vague point. Briefly stated, while inward associations are in progress the eye is fixed on infinity. During the phase of perception of external stimuli it is fixed on the finite. The author finds evidence of this alternation of phases in other forms of behavior, in the manner of speaking, gestures, etc.

Hollòs believes that by this view day dreams, dreams in sleep, slight repressions, and the most extreme pathological states are logically explained as arising from the same causes.

This view also sets forth the conditions which make it possible to get at the unconscious through psychoanalysis. A two-fold task is imposed on the patient to be analyzed. On the one hand he must permit himself to be wholly carried away by the flow of his associations; on the other he must be conscious of his associations. But assuming that flashes from the unconscious, as it were scotomata, fall into consciousness in the hiatus between phases, those memory lapses and errors which become the material for the interpretation of the unconscious would find ample explanation, as being of the same nature as dreams and neurotic and psychotic symptoms.

The author has sought to make clear the fact that the foreconscious is constantly enriching the content of the unconscious and that during our waking hours regular unconscious phases occur in consciousness which pass unnoticed by us. The fact that there is this constant interchange of activity does not in the least affect the existence of the unconscious as the depository of archaic phantasies and phylogenetic material. The alternating energizing of the inner and outer fields, however, furnishes opportunity for influx into the unconscious of qualitative modifications conditioned by external experience. [C. Willard.]

Meyer, Adolf F. JUNG'S PSYCHOLOGY OF UNCONSCIOUS PROCESSES.
[Internat. Ztschft. f. a. Psychoanalyse, Vol. IV, No. 6.]

The author reviews the position taken by Jung in this article, calling special attention to the points in which Jung differs from Freud. Jung claims that neither Freud nor Adler have covered the whole ground of the unconscious processes. The foundation of Freud's theory (the sexual) is feeling and in his application of it to pathological manifestations he has reference to introversion only. The foundation of Adler's theory is the will, the standpoint of thought, of which the characteristic manifestation is extroversion. Jung feels the necessity of formulating an entirely new theory embracing all forms of psychogenic disturbances. He assumes that the neurotic conflict always arises between a specialized or adapted function and an undifferentiated complementary one, usually in the unconscious. In the introverted type the conflict is between thought and unconscious feeling; in the extroverted, between feeling and unconscious thought. The neurotic conflict declares itself when the person finds himself in a situation where an adaptation is necessary which makes demands on an indifferntiated complementary function. For example, a

man who has spent his life in ambitious money making and has acquired power thereby, wishes to spend his money in enjoyment. He enters for the first time upon a situation which he can face only by means of a feeling component and falls into a neurosis because this component in his personality is undeveloped or undifferentiated. The object of treatment, according to Jung's views, is to bring the unconscious or undifferentiated part of the personality clearly to consciousness, so that it can be used in the adjustment to life. It is not possible to call this energy slumbering in the unconscious into activity without assistance; it is the office of the physician to supply this. All possible infantile affects are transferred to the physician; he becomes father, mother, teacher, etc. He also sometimes becomes a devil or a god, and in this circumstance Jung sees the evidence of a superpersonal unconscious, *i.e.*, a collective primitive unconscious. Jung aims not only at a reductive analysis by which the dreams and thoughts are separated into their reminiscent elements, but also at a constructive synthesis of the soul. Dreams are interpreted not merely in relation to past experiences, but they are considered to have a significance for the future of the dreamer, and to indicate mental tendencies which may be used for the better adaptation of the personality. In the unconscious, where these dreams and conflicts originate, are found not only personal remembrances, according to Jung, but an entire domain, hitherto undiscovered, which embraces the experiences of countless centuries in a complete phylogenetic history. Meyer states that from Jung's present work he can draw no other inference than that Jung, partly because of ignorance of Freud's views and partly because of resistances in his own personality, has utterly failed to grasp the idea of the unconscious and the importance of repressions. However, as Jung seems to be sincere, his claims that his conclusions are in advance of Freud's views may in the future be modified by a better acquaintance with the real scope of Freud's discoveries. [C. Willard.]

v. **Ophuijsen, J. H. W.** MASCULINITY COMPLEX IN WOMEN. [Internat. Ztschft. f. a. Psychoanalyse. Vol. IV, No. 5.]

Girls or women on comparing themselves with males often feel that something is lacking in their makeup; feel that they fall short of perfection, that they may have been injured in some way. The bitterness of the daughter against the mother often takes the form of a reproach that the mother has brought her into the world a girl instead of a boy. The author here presents his own observations on complexes arising from this psychic attitude. He thinks that the castration complex in women where they believe they once possessed a male organ and have lost it through some fault, is so nearly allied with the complex arising from the desire to be a man that the two forms may be included under one category, the main difference being that in the castration complex there is feeling of guilt while in the other the manly protest occupies the

foreground of the picture. The author's attention was called to the complex by a small number of cases—five, among them being one psychasthenic with compulsory ideas and one case of compulsion neurosis. Four of these cases the author was able to observe during a long period. He found that invariably at stage of development there had been a comparison of the patient's own body with that of a male person, a father, an uncle or a brother, as the incident from which the wish to be a man originated. The desire was found to exist when the patients themselves were not conscious of it, at least not in the primitive form of a belief in the possibility of possessing a male organ. The expressions by which the presence of this tendency may be recognized, even when there is no definite consciousness of the real thing desired, became clear in the analysis, taking the form of ambition to exercise power, the desire to press forward, the inclination to assume an aggressive attitude instead of the passive one characteristic of the female sex. In one of his patients, a successful musician, the author traces the various characteristics in detail. In childhood she had exhibited morbid curiosity in regard to the relation of her father to her mother as well as abnormalities in regard to the performance of the urinary functions. In childhood she had often heard her parents regret that she was not a boy. She felt the injustice of this attitude keenly and the resulting bitterness was very evident in the analysis. She was brought into constant competition with her brothers, surpassing one of them in her attainments but falling behind the other. She was deeply impressed by the form of the body in males which she had opportunity to observe in the members of her family, in her brothers, her father, and an uncle with whom in later life she fell in love. This incestuous love affair, in fact, was the immediate cause of the neurosis which rendered treatment necessary. Her dominating idea was that she was not like other women and that a penis was growing out of her body, confirmation of which she found in a slight abnormality of growth. From his observation of this case, together with his study of the other four, the author comes to the conclusion that the conditions giving rise to this phantasy is the identification with the father or with the father substitute, based on a narcissistic foundation. Clitoris eroticism plays an important rôle and the phantasy finds a favorable soil where the bladder and urethral libido is intense. If no successful homosexual or heterosexual adjustment is formed there is regression to an autoerotic level. The author fears that the cases here cited are too few to permit him to claim conclusive value for his impressions, but he is nevertheless impelled to publish them in the hope that they may serve as an incentive to further research. [J.]

Tausk, V. PSYCHOLOGY OF DESERTERS. [Internat. Ztschft. f. a. Psychoanalyse, Vol. IV, Nos. 4-5.]

In forming opinions concerning deserters, military courts have a different point of departure from psychologists. The author is well aware that, at a time when others are making supreme sacrifices for their

country, a defense of deserters will meet with little favor. Nevertheless he ventures to set forth the real pathological conditions responsible for the conduct of a large majority of these persons. The law expresses very definite views on the subject of right and wrong, but at the same time recognizes by implication the existence of psychological compulsions, with the result that complete confusion reigns in the legal view of the question. Tausk indicates the manner in which psychoanalysis may be applied to bring some order out of chaos. Three points should first of all be noted: the great majority of deserters never belonged with the fighting forces at all and should have been assigned to occupations behind the lines; the motive for desertion is rarely the desire to escape service, for the fugitives often undergo sufferings far in excess of those they would have endured in the field; at least half of the deserters who came to the author's attention were so clearly weakminded and mentally defective, that their condition was apparent at the first glance. The effort of the psychoanalyst is not, the author states, to include all these conditions under one general head so that the same punishment may be meted out to them indiscriminately, but rather to resolve the phenomena into their various psychic elements and in this way distinguish the different types of deserters and the real motives for their conduct. In the first category of deserters may be placed hysterics and epileptics. Persons suffering from these diseases are likely at any time to wake up, as from a dream, in a strange place without being able to tell how they came there or why; they certainly cannot be said to have had conscious intention of evading their duty. The second category is composed of restless souls without confusion or memory blanks. To understand their condition it is necessary to take into consideration certain of the principles of psychoanalysis. The great discovery of Freud is that childhood is not merely a transitional or provisional stage, but that the dynamic elements of childhood continue to exist in the adult, in some instances remaining almost unchanged. The child's chief characteristic is the inability to put off or renounce the satisfaction of its cravings. The child lives wholly according to the pleasure principle. By discipline and education a sublimation of these cravings is brought about and in the psyche a new source of satisfaction is developed when the springs of infantile pleasure run dry. With a great many children, however, discipline and education is impossible. They cease to advance beyond a certain level of development and there is fixation upon some fundamental and primitive desire or craving of childhood. What these persisting affects are has been discovered from an unvarying uniformity in numberless cases; one of them revolt of the son against the father, closely connected with the *Œdipus* wish, or love for the mother, and allied to the fear of the father leading to the castration complex. Now in this second category of deserters the histories reveal that the desertion from the colors is not the first flight of this sort. It will be found that the impulse has always been to escape from restraint—from the father or teacher or any other

person or authority which may be considered as a substitute for the father. They are in the grasp of an infantile affect whose full and irresistible force is mobilized by the most trivial incidents. They are in constant flight from reality, from the things they can attain and in constant pursuit of the unattainable. Deserters of this class may, then, be regarded as afflicted with psychic infantilism. In the third category the author places those deserters who stand in constant and torturing fear of punishment, even when no crime or misdemeanor has been committed. Here again we have a situation revealing a wrong relation between son and father. The sons of the previous category are fugitives from the father; the sons of the present category have not become emancipated to the degree of revolt but have lived in ceaseless dread and overpowering fear of punishment from the father. Hence this infantile fear is set in activity whenever they imagine that they stand in danger of punishment from the authority representing the father. In the fourth category may be placed those deserters who take to flight in order to escape the demands of service, almost without exception illiterate peasants whose circle of interests is of the narrowest, who have no conception of the meaning of the state and of the obligations imposed by life in community. In deserting they merely obey the primitive law of self-preservation. The fifth class of deserters is very numerous. They are neurotics in the narrower sense of the word, persons who are suffering from various compulsory ideas springing from the unconscious sexual life. In illustration the author cites the case of a young man in whom impotence led to a state of anxious fear of encountering anything new. The appointment of a new commander furnished the impulse to desertion. Deserters of the sixth class, namely, those who abscond from homesickness are also very numerous. In fact homesickness is a factor in almost every form of desertion. The longing for home arises from a mother fixation which in a large number of persons persists longer than is necessary from a biological point of view. In the adult the nostalgia for the mother, or the substitute for the mother, the "mother country" for example, is allied to the fear of losing the mind in alien surroundings, or from loneliness, all impelling to flight to gain the home protection, and being characteristic of an infantile level of development. The seventh category, those who desert for political reasons, the author states have not been studied by him, though he believes they would present features of psychoanalytic interest. The eighth category is composed of those who give as a reason for their desertion their opposition to war on general principles. Without doubt, the author observes, there are many highly intelligent idealists who have sacrificed themselves to this pacifistic principle but the behavior of the few cases offering this explanation of their desertion who were brought to his attention was scarcely consistent with enlightened idealism. They were persons who, after having served for a time, tried to run away and when this attempt was frustrated they had fallen into a confused state which the author was obliged to regard

as pathological. He places deserters of this type in the dementia praecox group. The law affirms that to constitute desertion there must be an intention to permanently abandon the service. In very few of these cases could it be said that there was any such intention. These deserters are for the most part wholly engaged in the flight from their own intolerable feelings. If the law is to take into consideration unconscious purposes it would be difficult to bring this understanding of the matter into harmony with precedent and prevailing customs. The solution of a problem of this sort would have to be left to a psychology of justice—a science which does not as yet exist. These deserters under the domination of the infantile pleasure principle are asocial and are punished for what is really a pathological condition.

The author closes his observations with what he calls a "jest most earnestly meant" in reference to another class of "deserters," noxious to the community, who also act according to the pleasure principle amidst the general suffering but who go unpunished, namely, the profiteers. The deserters are asocial; the profiteers are antisocial. [J.]

Abraham, K. PRECOCIOUS EJACULATION. [Internat. Zeitsch. f. a. Psychoanalyse, Vol. IV, No. 4.]

Notwithstanding the fact that ejaculatio praecox is the disturbance of male potency which is most frequently met with, no fundamental work specially devoted to the subject has thus far made its appearance in psychoanalytic literature: The studies of Steiner and Ferenczi only treat the subject briefly and as part of a general discussion of impotence. From his own observation of a series of cases the author arrives at the view that ejaculatio praecox is due to the abnormal sensitiveness of the urethra and a fixation of the libido on the urethral functions. It may really be regarded as a combination of two processes, he states. As far as the voiding of material is concerned it is an ejaculation, but in regard to manner in which the process takes place it is a micturition; the semen is not expelled in rhythmic movements, but flows forth in an effortless manner, as the urine does; with one signal difference, however—under normal conditions, the emptying of the bladder is more or less under voluntary control; ejaculatio praecox, on the contrary, is always involuntary. But in abnormal bladder conditions there is absence of control just as in ejaculatio praecox, and the fact is significant that those who suffer from incontinence of urine, who react to every emotion with irresistible pressure of urine, and who have never gained voluntary control of the bladder, or have gained it late in life are just the persons who are inclined to ejaculatio praecox. Further, the free associations of neurotics of this type furnish supplementary evidence for the solution of the problem. If the anamnesis of such cases is followed without prejudice one fact is found to recur with astonishing uniformity; all these patients experience pleasure in the performance of the bladder functions, indicating that the libido has remained stationary at an incomplete differential level; the genital zone is not, in the strict sense of the word,

the principal sexual zone and the libido is only imperfectly centralized in the glans penis. This level of development in the male corresponds to that in the female where the sensitiveness remains in the clitoris, as in childhood, the vagina never attaining the normal degree of differentiation. In females the result of the arrest of development is frigidity, in males ejaculatio praecox. Accompanying the disturbance of potency in males is a notable absence of the distinctively male characteristics. The attitude of these patients toward women is therefore of great interest in the study of the subject; their behavior permitting them to be placed in two groups which, however, are not distinctly separated from each other. One group is composed of men without energy, wholly passive and effeminate, the other of erethistic and over-vivacious persons, always in a state of excitement and haste. The seemingly irreconcilable contradiction in the two types of behavior is easy to explain when the analysis is carried beyond the superficial and obvious traits. We have here merely different modes of reaction to the same fundamental unconscious factor; at the root of both types there is an attitude of profound aggressive cruelty toward women—tendencies which are intolerable in conscious life and from which the neurotic finds himself in constant flight. In the dreams and fantasies of these patients the wish to kill the woman is often brought to light. The weakness and passiveness of the flaccid neurotic is a reactive phenomenon which has set in against the too powerful sadism; the male genital organ is deprived of its harmful power, it is no longer permitted to assume a condition in which it could serve as an instrument for the repressed sadism; the relaxation and passiveness obviate this danger; the ejaculatio praecox becomes the extreme reactive opposite of the sadistic trend. The erethistic aggressive neurotic lives in a state of constant hurry and turmoil, like those over-agitated women who live in constant anxious fear of not being able to get through with their trivial daily tasks. Men of this type perform the sexual act as though it were a piece of work which they were obliged to accomplish in all haste. They are in constant and anxious flight from unconscious sadism.

The same contrast of conduct is observable in the attitude of these two groups toward sport. The first type is disinclined to any sort of muscular activity; the other pursues the game too zealously and through very eagerness fails to make the points aimed at.

In the unconscious life of the patients these forms of behavior are closely connected with the attitude toward the father, with the fear of the all-seeing eye of the father, of his relentless hand in punishment. We here find ourselves, the author observes, in a terrain in which we are well oriented. The same anxiety, revolt, ceaseless flight and the same surrender and extreme self-negation in the relation of son and father are well known in the psychic life of the child and in the infantile conflicts of adults. Here belongs the castration complex, the influence of which in the psychogenesis of ejaculatio praecox Freud has recognized. Psychoanalysis invariably reveals that the castration fear first arises from

observation of the absence of penis in the female and patients suffering from *ejaculatio praecox* regard the female organs with superstitious awe. One form which castration phobia takes is the fear of the loss of the member in the sexual act. The sudden impotence, the premature ejaculation constitutes a timely rescue from the threatened danger.

The author regards all these facts as confirmatory of his view that those suffering from *ejaculatio praecox* have never attained a normal degree of development and an adult attitude toward the object. There is not complete fixation of the libido at an infantile level, such as Freud has shown to be at the root of the paranoiac, but there is a disturbing influence from strongly narcissistic tendencies. The author calls attention to the element of infantile narcissistic exhibitionism in those subject to *ejaculatio praecox*, and to the narcissistic over-valuation of the products of the person's own body. There is an ambivalency associated with exhibitionism, the desire to exhibit to the mother (or the woman, the mother-substitute) and at the same time a disdain for the person to whom the exhibition is made, and both values are recognizable in patients of this stamp. Finally, the author calls attention to another allied phenomenon which is more rarely met with by physicians, namely, retarded ejaculation, to which he applies the name *impotentia ejaculandi*—due also to narcissistic fixation. The psychoanalytic treatment in these cases must be directed against the fundamental narcissism. [J.]

Freud, S. THE UNCONSCIOUS. [Internat. Zeitsch. f. aertz. Psychoanalyse, Vol. III, Nos. 3, 4, 5.]

In the average individual as well as those varying from the average the data of consciousness are to the highest degree fragmentary. Psychic acts take place which can only be explained by supposing other acts of which, in consciousness itself, there is no evidence. When by certain influences exercised in a supposed unconscious we bring about in consciousness certain results definitely aimed at, the existence of the unconscious is incontestably proved. Many of the latent elements of the psyche can be transformed into conscious processes or be replaced by the latter; they can be described by the categories which are applied to the conscious psyche, such as ideas, decisions, etc., and indeed of many of them we are forced to admit that they differ from conscious processes solely in the fact that we are unaware of them. We may gain an idea of our own unconscious in the same way as we gain an idea of the existence of consciousness of other creatures—by inference. Each one of us may say: "all those acts and expressions which I notice in myself and which I am unable to connect with the rest of my psychic life I may judge as though they belonged to another person and could receive illumination from the psychic life of that person." In this way we are enabled to interpret those acts which we refused to recognize as belonging to our psyche. This process of forming judgments notwithstanding the resistances of our own personality leads to the discovery of a second

consciousness, rather than to that of an unconscious. The psychoanalytic assumption of a second soul seems thus, on the one hand, an extension of the primitive animism; but, on the other, an application of the principle of "correction" which Kant found necessary for the proper estimation of sense perceptions. Kant warned us not to overlook the fact that our perceptions are all subjectively conditioned and that they should not be thought to reveal the thing-in-itself, which would be to compound phenomenon with noumenon. In the same way psychoanalysis admonishes us not to mistake the conscious aspect as a revelation of the real nature of the unconscious. The psychic, like the physical world, may not be at all as it is perceived by us. We may find satisfaction, however, in the experience that the inner object is more accessible to us than is that of the external world.

Though the characteristic of being unconscious is the quality of certain psychic processes it is by no means their only characteristic. Psychic acts of very different sorts have this one quality in common—unconscious repressed elements that are merely latent and differ in no way from conscious processes, and other elements which, if they should become conscious would stand in most striking contrast with the conscious elements. And thus it comes that the words conscious and unconscious must sometimes be used in a merely descriptive manner to denote a condition of the element and at other times to designate an element as an integral part of a system. It is to the latter aspect that the author mainly directs attention in this article.

Studying the organization of the systems to which certain psychic elements belong and the typical characteristics of these elements, the author states that in general, in becoming conscious, the psychic elements pass through two phases. Between the two phases is a deciding process, the censor, which determines whether a psychic element is fitted for admission to consciousness. Having passed this censor the element remains in the foreconscious until circumstances secure its entrance into consciousness proper. If it should be found that there is a second censor between the foreconscious and consciousness we should have three phases for the psychic element and psychoanalysis would have advanced still further in the direction of a dynamic explanation of mental life to take the place of a mere description of it.

Discussing the unconscious from the point of view of localization, the author states that anatomical connections, though obviously existing in a general way must be disregarded because of the difficulties presented by a psychophysical parallelism. The psychic elements may be regarded as following their own necessities, and then two possibilities in regard to their relative localization present themselves: (1) that in passing from the unconscious to the foreconscious or to consciousness a new impression may be formed with the preservation of the first one; or (2) the transition may consist in a transformation, or alteration of condition. The first appears the cruder but at the same time the more adaptable concept;

the second the more probable, but less plastic. In the present state of knowledge it is impossible to decide the question definitely.

In regard to the content of the different systems the author states that ideas may exist either in the conscious or the unconscious; that instincts are never conscious; and that it belongs to the essential nature of emotions to be conscious. In cases where the nature of emotion is not at first recognized it is, upon recognition of that nature, spoken of as having previously been unconscious—from a negligent use of terms, however; for it is not the feeling which is unconscious but its idea, which has been separated from it and repressed. One of three fates may overtake an emotion: it may continue to exist as such; it may be transformed wholly or in part into a qualitatively different affect (especially into anxiety); or it may be suppressed, that is, its development may be prevented. According to this view the repression really prevents the instinctive craving from being transformed into mental expression—a discovery of special interest, for it shows that consciousness normally dominates the emotional as well as the motor system. If the conscious system be assumed to preside over emotional activity, this would explain the special rôle of the substitute idea in the neuroses. The development of the affect may proceed directly from the unconscious and then a form of anxiety is the result, or it may attach itself to a substitute idea in the conscious system and then the emotion is not only set into activity by this idea, but its qualitative character is determined thereby.

The repression takes place on the boundary between the unconscious and the foreconscious and consists in a withdrawal of the foreconscious energy with preservation of the unconscious energy—an assumption which seems confirmatory of the view that the process does not consist in a topographic change but in a functional modification of the condition of the element. Now the mere thrusting back of an element still possessed of energy to return to consciousness would not insure its continued exclusion. To bring this about an opposing energy is brought into effect in the form of a substitute.

The characteristics which distinguish the unconscious elements (the original instincts, trends, or tendencies) from other psychic elements are: mobility of energy in the form of displacement or condensation (the primary processes), absolute indestructibility, absence of time relations, domination by the pleasure-pain principle instead of by the principle of reality.

Repression is far from being the only form of intercourse between the conscious and unconscious systems. One striking example of their coöperation is phantasy. Here formations so highly organized that they seem to belong to consciousness hover on its very threshold. They are wholly unfit for admission into the conscious system, however, and under normal conditions are thrust back into the unconscious the moment they receive any accession of energy. It appears as though they pass the censor between the unconscious and the foreconscious only to meet

with a second censor between this latter and consciousness, suggesting the existence of three psychic systems.

How far the unconscious can be influenced by consciousness has not as yet been determined. Upon the possibility that another person can influence consciousness and thus reach the unconscious the psychoanalytic treatment is based. It may, however, be assumed that the spontaneous influencing of the unconscious from consciousness would be a long and difficult process, if it were possible at all.

The transference neuroses do not furnish very abundant nor very definite information concerning the unconscious. It is the narcissistic disturbances which have given us the best data concerning it. Since 1908 the analysis of dementia praecox (Kraepelin) or schizophrenia (Bleuler) has shown that this disease form is characterized by a peculiar failure of the object of interest; the libido is first turned to phantasy creations and finally becomes introverted; no new object is sought and the ego reverts to a primitive objectless condition. A further characteristic of this disease is the peculiar speech disturbance—words are distorted or used in bizarre ways, and are joined together in such manner as often to render the speech of these patients unintelligible. From the study of numerous instances the author comes to the conclusion that the words are subjected to changes analogous to those which in dreams the concrete images of the things undergo—that is there is condensation and displacement. It would seem as though the verbal idea of the object is present though there is no trace of the object itself. Attention is thus attracted to the verbal image in contradistinction to those impressions which constitute the image of the object as furnishing a clue to an important difference between the conscious and unconscious content. It is the concrete image of the thing which exists in the unconscious, while in consciousness the image of the thing exists plus the verbal image.

The formal law which obtains in the transference neuroses, namely, that repression is a process which takes place on the boundary between the unconscious and consciousness cannot be applied to schizophrenia without modification. It is apparent to the most casual observer that in this latter disorder the flight from reality is much more fundamental and profound. The anomaly that the verbal image, obviously belonging to the highest and most fragile psychic formations should be intact amidst the destruction of other more hardy elements is accounted for by the author upon the supposition that the verbal image here represents a first stage of recovery. Our psychic activity moves in two opposite directions—either from the unconscious toward consciousness or vice versa. Despite all repression this second path must remain open and is accessible to efforts to regain the object. In ordinary abstract thinking there is danger of neglecting the relation of the word to the unconscious idea and in thus dispensing with the object, abstract thinking, according to the author, presents a resemblance to the thought processes of schizophrenics. [J.]

Ferenczi, S. POLLUTION WITHOUT ORGASTIC DREAMS AND VICE VERSA. [Internat. Zeitsch. f. a. Psychoanalyse, Vol. IV, No. 4.]

The author offers the following explanations of these phenomena: In case of pollution without dreams the unconscious wish is sufficiently strong to set the physical genital processes in play but is not strong enough to overcome the opposition of the censor between the unconscious and the foreconscious. In the orgasmic dream without pollution the unconscious sexual wish in and for itself is too weak to produce an ejaculation. The dream in this case is only a substitute for one of the unstable thoughts of the foreconscious. In sleep the vigilance of the censor is relaxed and the door to consciousness is opened wide with the result that the wish in spite of its weakness gains access to the world of consciousness. It is only the strong unconscious wish that is able to influence the physical processes; the foreconscious wish sets only psychic processes into activity. The fact that in instances where there is a real weakness of the genitals orgasmic dreams without pollution take place does not constitute an exception to this rule. Here too the unconscious component of the libido must be regarded as weak, and the dream must be regarded rather as the fulfilment of a foreconscious wish for pleasure. [J.]

Reik, Th. FATHERHOOD AND NARCISSISM. [Internat. Zeitsch. f. aertz. Psychoanalyse, Vol. III, No. 6.]

When it is claimed that narcissism is the primary impulse of the personality the biological as well as other points of view must be taken into consideration. Said Freud "The individual has a double existence, as an law unto himself and as a link in the chain of successive existences. The latter rôle is thrust upon him against his will or, at least without the active consent of his will. The individual regards his sexual life as one of his own special purposes, while from another point of view it is clear that as a whole he is a mere dependent on the germ-plasma which opposes its forces against the primariness of the pleasure principle. The individual is merely the temporary repository of a substance which may be immortal—just as an administrator of a permanent institution is only for a time an occupant of that place." In this sentence the problem of reproduction is for the first time touched upon by psychoanalysis. The question whether there is a psychic tendency to reproduction in addition to the two powerful instincts, self-preservation and the libido, is one of the most important of biology and psychology. It must be conceded that there are very powerful wishes and strivings in this direction in the human will—so powerful, in fact, that many writers have been led to assume a primary tendency of this sort. For example Havelock Ellis claims that in women there is an independent maternal instinct unconnected with the sexual libido, the desire to have children being often present where there is no inclination for sexual intercourse. The author however points out grave objections to this assumption: there is no

tendency to reproduction in the soul of the child; this tendency is not universal in mankind; the desire never acquires the elementary urgency of hunger or the libido. The author would not, with Nietzsche, go so far as to say that the desire for reproduction is a pure myth, but would say that it is a mere biological problem, having no more representation among the psychic forces than has the fertilization of the egg, for example. The only elementary tendencies discoverable on the psychological side, without recourse to teleological hypotheses, he asserts, are those of self-preservation and of the sexual appetite, and he denies that the desire for progeny is a direct product of the sexual instinct. The tender feeling for children arises because they are the result of sexual intercourse. Psychoanalysis has shown that the sole original goal of the sexual impulse is its satisfaction—a fact proved by the autoeroticism of infancy and by the perversions. For this reason in studying the psychogenesis of the desire for children (always, of course, leaving out of consideration biological determinants) the primary predisposition should be carefully traced through all their manifestations in character for the purposes of discovering whether the longing for children may not have origin in them. Taking first this desire in the male sex, Reik finds that it is composed of feelings which have long been recognized as effective in the family romance. Three principal traits have been distinguished, which, however, are often merged into each other, namely, the feeling of enmity toward the father; the tender feeling—it may even be said homosexual feeling toward the same man; the remnant of a narcissistic egoistic emotion which is expressed, among other ways, in the desire to be like the father even to the extent of having a child. In the main it is the continuation of these feelings, somewhat transformed at puberty, which govern the future relations of father and son and the narcissistic foundation is particularly discernible in the wish of the father to be loved by the son. Then too in treating the son as a second ego, as continuation of his own personality the father, through his hope in the child, builds up a defense against his own mortality. In the family romance the child, led by the unconscious, believes himself the offspring of high parentage—that his parents are not his real father and mother, but that he has better parents. So led by the same impulse, the adult believes his own child to be the most perfect on earth—he glories in the traits of the child which meet his approval and is implacable towards what he considers its faults. According to the author the desire for children in women is also a substitute for repressed narcissism. In the child which she bears she feels vanity; a part of her body appears before her as a strange object with which she identifies herself, upon which she can lavish all the love springing from her own narcissism. [C. W.]

2. PSYCHOSES.

Stocker, A., and Vasiliu, D. AN EXPERIMENT WITH SERUM THERAPY IN DEMENTIA PRECOX. Société de Psychiatrie de Paris, April 22, 1920. [*L'Encéphale*, 1920, May, Vol. XV, p. 327.]

Serological and hematological clinical examinations in schizophrenic syndromes have led to the conviction that there is an organic substratum for the disease, though little is known concerning its nature. Some indications concerning the pathological physiology of the disease seem to be furnished by the Abderhalden reaction, and Bayard Holmes claims to have found defense ferments in the serum of dementia precox patients. Following these views, the authors instituted the experiments here described. That there are remissions in dementia precox is a clinically established fact (Ballet, Bleuler, Dupré, Kraepelin, and others). Blood serum was taken from a dementia precox patient in one of these periods of amelioration of the disease. The intermission was spontaneous and pronounced, and the serum was taken from him on six occasions, at intervals of five days. When the second patient was in a condition of stuporous helplessness, intravenous injections of the serum from the first patient were made repeatedly (fourteen times over a period of one month) in quantities varying from 10 to 35 cm., amounting in all to 205 cm. The result of this treatment was not immediately apparent, but at the end of the second week signs of improvement were noticeable. Toward the end of the third week the patient answered questions, arose in the morning and dressed. Two weeks after the cessation of the treatment the improvement was very marked. Patient at his own initiative asked for a postcard, wrote it and addressed it; it was to his brother requesting a visit. The authors regard the gradual recovery as due rather to the stimulation of the antitoxic functions of the organism than to the introduction of defense substances ready prepared, because in the latter case the result would have been more immediate and ephemeral. [J.]

Rehm, O. CASE H. AND CASE SCHR. A CONTRIBUTION TO THE QUESTION OF PERSISTING OR RESIDUAL INSANITY. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLVII, p. 270.]

The author describes two cases belonging to the manic-depressive group which, in their course and in certain manifestations, deviate from the usual picture. The first case was pronouncedly chronic in type. This patient was attacked at twenty-two years of age with a slight depression and at twenty-eight years with a deeper depression of obviously pathological nature. The third phase was in the form of profound melancholia alternating with mania, and from this period on to the forty-seventh year of life the patient was apparently never in health, the disease for the most part assuming the form of manic exaltation; after the age of forty-seven of alternating depression and excitement.

A very unusual phenomenon in this case was the continuation of the ideas of persecution from one affective phase to the other, the anger, irritability, and persecutory ideas remaining the same in both manic and depressive phases. This persisting element is not to be interpreted as a sign of mental deterioration, nor as a residual insanity, but is to be regarded as an interesting symptom of chronic manic-depressive insanity, and may perhaps be looked upon as indicative of the chronic course of the psychosis. The second case was that of a senator who published his own life in a book of 516 pages under the title of "Thoughts of a Sufferer from Nervous Disease." From an apparently healthy condition this patient fell suddenly ill at the age of thirty-six and hypochondriac ideas made their appearance, lasting for several months. At the age of forty-two a grave depression of anxiety type with psychomotor excitement set in; at forty-three a lighter depression closed this phase. At fifty-one he had another attack, lasting, with remissions, three and one half years—an anxious delirious depression of hallucinatory character. This condition gradually changed into a hypomanic excited state, in which the delusions of sense and systematized ideas were continued. Then followed five and one half years of comparative health, in which the pathological ideas receded greatly into the background, without entirely disappearing. The close of life brought a psychosis with depressive color, slight psychomotor excitement, confusion, and insane ideas, connected with a reduction of mental and physical forces. This case, too, is considered by the author to be one of manic-depressive type. From a delirious hallucinatory stadium a residual insanity developed, as in alcoholic or epileptic delirium, from which patient never completely recovered. This case could not be placed in the schizophrenic group without extending this group unwarrantedly, in the author's opinion. [J.]

de Teyssieu, M., and Belot. AUTOMUTILATION OF THE TONGUE. [Journ. de Méd. de Bordeaux, 1920, 91.]

A sixty-year-old woman in an attack of depression cut off the terminal inch of her tongue. Standing before the glass while alone, she held the tip of the tongue with her left hand and deliberately cut off the end by means of a table knife. The wound healed well. This type of automutilation is said to be uncommon. Blondel could find only six examples up to 1906.

Laiguel-Lavastine. FAMILIAL DEMENTIA PRECOX. [Presse Med., June 2, 1920, Med. Rec.]

The author presented before the society a brother and sister, both attacks with progressive dementia with lack of insight, disorientation, apathy, grimaces, and assumption of meaningless attitudes. The brother showed more mutism and inertia, while the sister showed more excitement with attacks of laughter, puerilism, and timidity. The diagnosis was hebephreno-catatonic form of dementia precox which appeared in the boy at the age of eighteen and in the girl at the age of twelve. The

father was an alcoholic and probably syphilitic, but the blood of the patients showed no complement deviation. The familial form of this condition is not common, so that the author felt justified in calling attention to this example. In another case in his practice three sisters were successively attacked. All showed the paranoid form. One sister has since died of tuberculosis. For years it has been noted that in familial psychoses paranoid forms are more common than others, while familial incidence naturally means hereditary taint. In discussion Delmes mentioned the case of the daughter of a celebrated professor developing evidences of hebephrenia now many years ago. Last year a younger brother began to grimace and show negativism, suggesting incipient dementia precox. It is not unlikely that this case may become attenuated, but recrudescence will doubtless follow.

Hart, B. DEMENTIA PRECOX AND ITS RELATION TO OTHER DISORDERS. [Br. Med. Jl., September 25, 1920, A. M. A.]

Hart feels that dementia precox has established its claim to be regarded as a clinical entity in the sense that it marks off a group of cases with notable similarities in their symptomatology, course, and outcome, although the borders of this group cannot be accurately defined. To what extent it can claim to be an entity in a more exact sense must depend on the success with which a specific morbid process can be shown to underlie it. From the clinical standpoint, a number of conditions are either akin to dementia precox in the similarity of the morbid process involved and the clinical pictures displayed, or are connected to dementia precox by a chain of cases showing a gradual transition from one to the other. The most important of these conditions are mental deficiency, including imbecility and idiocy, the psychoneuroses, including hysteria and the compulsion neurosis, manic-depressive insanity, Meynert's amentia (exhaustion psychoses, confusional psychoses), paranoia, and Kraepelin's recently constructed conception of paraphrenia.

Laignel-Lavastine. DEMENTIA PRECOX AND TUBERCULOSIS. [Jour. de Med. de Paris, June 5, 1920, Med. Rec.]

Laignel-Lavastine has reason to believe that certain precocious dements owe their condition to a tuberculous substratum. The classification of Kraepelin naturally gives no room for this supposition, being wholly symptomatic. The older view of Morel recognized an acute dementia, which particular form the author thinks he has seen in candidates for tuberculosis. It is possible that consumption masks these cases which tend to end at an early date from that disease, but the author has seen dementia in fibroid phthisis as well. The cases are very complex, with history of parental alcoholism and syphilis, while clinically any of the forms of Kraepelin may be represented. Cases are cited from the writings of various alienists and from the author's own material. Thus one young man, the son of an alcoholic father who was probably also syphilitic, developed mental weakness, characterized by failure to realize

his condition, affective indifference, disorientation, apathy, perseveration of attitudes, grimaces, etc. He was found to have chronic pulmonary tuberculosis of the right apex. In another group were two young men, both of whom were red headed and tuberculous, who showed paranoid symptoms. In a third group the subject had tabes and amaurosis due to the same, with phthisis and paranoid dementia. Autopsy showed the coexistence of tuberculosis and metasyphilis. A fourth group was represented by a young man of phthisical habit who, after a delirious episode, exhibited marked mental failure. Hence the mental state which develops in chronic, nonprogressive cases and in mere candidates for phthisis cannot be due to any acute course pursued by the disease, although such a view seems to have been entertained in some quarters.

Pregowski, P. CONCERNING THE TREATMENT OF DEMENTIA PRECOX.
[Archiv f. Psych., 1918, Vol. LIX, p. 253.]

The author believes the disturbances in dementia precox, as in neurasthenia, to be primarily due to vasomotor disturbances, and that these disturbances are the point of origin for all the phenomena. His therapy was, therefore, directed against fundamental factor. In order to influence the vasomotor centers, hot compresses were applied to the spine; the whole surface of the body was subjected to massage; high pressure douches and hot baths were given. Besides a mild iodine treatment was undertaken. Of forty-eight cases of dementia precox so treated, fourteen were cured, eighteen were essentially improved, nine were somewhat improved, and seven cases were not influenced in any way. The author observed no ill effects from the treatment; the compresses and hot baths, however, when the dementia precox is complicated with some other diseases, must be administered with some caution. The hot compresses have a sleep-inducing influence, and when they are too frequently applied they lose their efficacy. [J.]

Weichbrodt, R. CONCERNING DEMENTIA PRECOX IN CHILDHOOD.
[Archiv f. Psych., 1918, Vol. LIX, p. 101.]

The author describes two cases of dementia paranoides occurring in boys at the age of ten years. The ideas were not very fixed and there were days when the patients were not dominated by them. One boy recognized this himself and maintained that after such days he dreamt more intensely. While there was no mental deterioration in one of these children, and his intelligence was entirely in keeping with his age and education, there was in the other a considerable diminution of mental capacity, the regression in a single year being very marked. The picture of this disease in children does not vary in its main features from that in adults. One of the boys had systematized delusions which were quite typical in character. It was difficult to distinguish one of these cases, at the beginning, from a case of psychopathic constitution, illustrating how difficult this differentiation is in the initial stages of dementia precox in childhood. [J.]

Walter, F. K. CONTRIBUTION TO THE HISTOPATHOLOGY OF ENDOGENOUS DEMENTIAS. [*Zeitsch. f. d. ges. Neur. u. Psych.*, 1919, Vol. XLVII, p. 112.]

Until recently many psychiatrists regarded dementia precox as a functional disease, because no histological changes due to the disease could be discovered, and even now there is no pathological anatomy for dementia precox as there is for some other diseases, for paralysis, for instance. The author describes a series of cases of dementia precox, the histological examination of which he made by a method of his own invention, which, however, resembled the gold sublimation method of Cajal. In three of these cases circumscribed glia foci of plasmatic cells were found, a slight hypertrophy being observable in the vicinity of the foci. In all cases the foci were in the medullary lamina and the lower cell layers of the cortex; in one case they were in the temporal lobe. The author made repeated efforts to discover some clue to the etiology of the foci, but with no further result than to exclude the possibility that they were of inflammatory origin. They seemed to resemble the foci in pernicious anemia somewhat, but their structure proved to be different. They were not numerous and were difficult to find, and, as hypertrophic glia cells tend to degeneration, they may have been only transitional formations. In one case of eleven years' duration there was no indication of this fact, though in another, of fourteen years' duration, the thin and somewhat irregular dendrites and occasional interruption of continuity indicated a beginning atrophy. [J.]

Friedlaender, Erich. OPINIONS ON SCHIZOPHRENIC DISEASES IN ACCORDANCE WITH EXPERIENCES IN THE WAR. [*Ztsch. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLVIII, p. 301.]

Mental diseases in soldiers very often revealed psychogenic or hysterical characteristics, but schizophrenic features were also often met with, and it was frequently difficult to make a differential diagnosis between a psychogenic reaction and a schizophrenic reaction. Cases of this sort were interpreted in a general way as being due to schizophrenic predispositions (schizophrenia imminens, Alters). In these instances the disease is set in activity in the form of a disturbance of psychogenic stamp which usually runs an episodic course and subsides without leaving any traces behind. Even those cases in which the schizophrenic symptoms predominate, and which clearly belong to the schizophrenic group, assume a more psychogenic character and course than the cases of dementia precox usually met with in times of peace, having a more benign character, with tendency to remissions or complete recovery. Because of this close relationship between the psychogenic reaction and the schizophrenic diathesis the view seems no longer tenable that schizophrenia in its progress is wholly uninfluenced by external circumstances. Therefore a patient suffering from disturbances of this nature should be considered entitled to indemnity, if up to the time of draft he was

capable of earning his living, and if it be proved that his disease was due to conditions in military service. [J.]

Rawlings, E. HISTOPATHOLOGIC FINDINGS IN DEMENTIA PRECOX.
[Am. J. Insanity, January, 1920.]

Twelve cases were selected from among fifty-two precox cases worked up in the laboratories as being free from senile and arteriosclerotic changes and those due to toxemia from chronic visceral processes. Macroscopical atrophies were found in ten of the cases, usually most severely involving the frontal regions. Agenesis and aphasic factors were found in eleven of the cases, four showing a defective basis and eleven a hereditary background. The following histopathologic conclusions were drawn: The nerve cell of the various cortical regions taken showed an atrophy of bodies and nuclei; a granular degeneration of the Tigroid substance with an unequal clumping within the cells or an entire disappearance from their bodies; a diffuse and frequently intense staining of the cellular protoplasm; an attenuation with partial fragmentation of the cellular neurofibrils; protoplasmic processes which were atrophic, distorted, and bent at varying angles to the cell bodies. The more acutely degenerated nerve cells showed marked fatty deposits in abnormal positions or entirely filling the cell bodies, the fat granules being seen in the axis cylinders and apical processes and frequently outlining the cell prolongations. The glial nuclei, especially of the molecular and infrastellate strata, showed an irregular stippling with fine fat granules. The adventitial cells of the blood-vessel walls and occasionally of the vessel luminae contained large amounts of lipoidal material. The glial structures showed varying degrees of regressive changes. Shrunken, frequently irregular, diffusely staining glial nuclei were seen in both gray and white substance. Fiber-forming types in all stages of regression from the large protoplasmic bodies to the shrunken nuclei with exceedingly coarse fibers being seen, in several cases forming foci of gliosis in the molecular and infrastellate strata. The surface mat quite generally showed an increase in width with focal extensions of its coarse fibers into the zonal layer. The ameboid types of glial cells observed in these cases were not those found in acute terminal processes. Acute satellitosis was insignificant and inconstant. Neurophages were found closely approximated to the more acutely degenerating nerve cells or lying in lacunae of their cell protoplasm. They were seen attacking irregularly the nerve cells of all layers and were noticeably absent in regions in which the destructive processes were of long duration. The cerebella in three cases examined showed destruction of the nervous tissues, more marked on the summits of the convolutions and decreasing toward the bases. Over the summits the Purkinje cells were extremely atrophic and pyknotic in appearance. Along the sides and bases they showed varying degrees of more acute alterations. There was a patchy loss of these cells. Considered from the regional point of view, the organic changes

observed in these cases were generally found most severe and of a more chronic nature in the frontal regions, though several of the cases showed the involvement most severe in the central regions. There was a surprising difference in the degree of alterations in the two hemispheres, those in the right being usually much more recent and acute in type. Stratigraphically the first, second, and third nerve cell layers showed the most severe involvement, the severity and diffuseness of the changes decreasing toward the third stratum. There was a singular fragmentation of the stellate nerve cell stratum in all these cases. While there had been no special effort in the present work to trace the disease process, a general impression was obtained from the study of the various types of cells in all strata that the initial process was one of moderate swelling of both cell body and nucleus, followed by a gradual breaking down of the normal nuclear chromatin structure; later by an atrophy and fragmentation of the neurofibrils, with subsequent granular degeneration and irregular clumping of the Nissl granules; the final stage terminating in one of two conditions, according to the degree of the vicious influences or the original resistance of the cell, viz., moderate atrophy followed by more or less acute fragmentation and extreme pyknotic atrophy. [Author's abstract.]

Körtke, Heinrich. THE DEMENTIA PRECOX QUESTION. [Ztchr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVIII, p. 354.]

It was only after bitter struggles and with various reservations that Kraepelin's psychiatry conquered the world, taking the place of other diagnostic systems or reforming them to a considerable degree. Hoche and others opposed Kraepelin's classification, calling him an optimist and affirming that his categories are not founded on realities. Even Alzheimer, one of Kraepelin's most ardent disciples, felt that many objections could be made to his views, and in a treatise devoted to his defense Alzheimer admits that the conceptions dementia precox and manic-depressive insanity are only tentative forms which should lead to a wider understanding of the realities. Of recent years great advances have been made in the paths blazed by the Kraepelin school. These advances have led to a deeper knowledge of the pathological anatomy of the psychoses and to a realization of the importance of serology and of a knowledge of the functions of the inner secretory glands for an understanding of mental diseases. The author asks the question whether psychiatrists are not again as far from agreement in regard to their classification of these diseases as they were in the pre-Kraepelin period. As an example of this disharmony he cites the variety of views on the dementia precox question, as to its curability, and as to its origin, whether due to a hereditary diathesis or other factors. He comes to the following conclusions: The principal reasons for confusion in psychiatric systems is the present obscure "mixed psychologico-somatic manner" of looking at the psychoses. The psychoses should be regarded from two separate

and distinct points of view, the psychological and the somatic. This leads to a two-fold classification, *i.e.*, into a psychic and into a somatic series. The paradigm of these series is furnished by dementia precox. In one category are the mental forms under which it appears, and this is contrasted with the morbus dementiae precocis as the somatic foundation running parallel with the mental symptoms, and existing both with and without mental manifestations. Behind the somatic category is always the question, "What is the reality?" and the series is constantly reconstructed in keeping with the advances of science. Behind the psychic category is the question, "What shall we call it?" and the formation of this series is a matter of convention. Practical psychiatry seeks stable and uniformly defined designations for diseases, and this is a result which can only be attained through mutual agreement of opinions. [J.]

Voigt, Leonhard. CONCERNING DEMENTIA PRECOX IN CHILDHOOD. [Zeitsch. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVIII, p. 167.]

The author describes twelve cases of dementia precox in children from the ages of three years to puberty, showing that this disease occurs even in the earliest years of childhood. The course of the disease in children assumes various clinical forms. Sometimes the onset is insidious and the mental weakness develops gradually without any very noticeable signs, or the disease may begin with an acute psychosis. The disease picture in children and adults shows differences corresponding to the different mental development of the two groups. The katatonic and depressed forms are the ones most usually met with in early years—a fact explained by the undeveloped volition and emotional life of children; forms in which delusional systems are constructed are rare. The terminal condition of the disease, the early and acute stages of which often does not come under the observation of physicians, may resemble the picture of idiocy or imbecility. It therefore seems possible that a considerable number of cases of weak-mindedness are really dementia precox cases, the acute symptoms of which have subsided. Signs indicating this origin may often be discovered (mannerisms, stereotypies, negativism, etc.). The fact that dementia precox occurs in the early years of life permit conclusions to be drawn concerning the etiology, namely, that no connection between puberty and the disease can be assumed (a fact further confirmed by the occurrence of the disease in late life), and that the disease is of hereditary origin. Evidence in the same direction is that, in a large percentage of dementia precox cases occurring in adults, signs indicative of the disease—peculiarities of character, automatism, negativism, etc.—had been manifested in childhood. [J.]

BOOK REVIEWS

Pottenger, Francis Marion. SYMPTOMS OF VISCERAL DISEASE. Second Edition. [C. V. Mosby, St. Louis, 1922.]

In our review of the first edition of this most excellent book we welcomed the appearance, practically for the first time in internal medicine, of a dynamic pathology of disease processes. Also a pathology that recognized that the body was a unicum and that such a unity was made possible only by means of the nervous system. This attitude has been one which has been preached for years in the pages of this Journal and by many neuropsychiaters in this country. It finally "got over" into internal medicine and Pottenger's book dealing with a "Study of the Vegetative Nervous System in its Relationship to Clinical Medicine" is one of its fruits.

Too long has a sort of jealous specialization refused to see beyond the borders of its own field; too long has even the nervous system been regarded as a special group of organs, whereas it must be grasped that, even though it has its special problems, it has its general problem of integrating the bodily organs. It wires up the different dynamos of the human machine and syncrizes its effector activities. It makes of a group of energy systems one homologous synthesis, the body as a whole. There is no comprehensible pathology of any organ of the body that leaves this integrating part of the machine out of its reckonings.

The conceptions of inflammation, of toxic degeneration, of fatigue, etc., are all woefully inadequate if the tie that binds all into a unity is forgotten.

The oldest synthesizing mechanism is what has come to be the vegetative nervous system and hence Pottenger's service to have incorporated it as an essential dynamic factor in the understanding of visceral, of all, disease.

His second edition is a vastly improved one over his first. Its great success is welcome. It shows that the thinking medical man is trying to slough off the old shell of a purely descriptive kind of pathology—one that thinks only in terms of cells and their alterations, instead of the forces that make them. Our medical concepts are still too burdened with *autistic* thinking. We think too much in terms of our own phantasies, instead of in terms of a more biological reality, in medicine as in everything else.

One thing Pottenger's book still lacks: the informing higher synthesis which is grouped behind symbols. When in a subsequent edition he can progress beyond the hormone, as a type of tool working at the physico-chemical level, beyond the reflex arc working at the

sensori-motor level, to the symbol working at the level of human conduct and racial destiny, then he will have written a work of enormous importance to all conscientious students of medicine.

Vaerting, M. *PHYSIOLOGISCHE URSACHEN GEISTIGER HOCHSTLEISTUNGEN BEI MANN UND WEIB.* [Marcus and Webers Verlag, Bonn, 1922.]

The contrasts that are found in the male and female have always been subjects of much inquiry and speculation. All too frequently the necessary opposites have been judged on the basis of an *a priori* "normal" for the one, or the other, depending on the unconscious sex proclivities of the judge. My "doxy" is "orthodoxy," and the other is "heterodoxy." This is the rule in practically all the contributions to this problem.

The present small contribution does not avoid entirely this tiresome stupidity, but in so far as he has confined his study to the details of *periodic variations* of production activity in the male and female, he has evaded fairly successfully this usual *cul de sac* of profitless and prejudicial comparisons. These variations in working capacity he holds are analyzable if one starts with the female periodic menstrual biological cycle. From this he cursorily discusses coitus, pollution, monogamy, polygamy, etc., in its relations to mental activity. It is all from the conscious standpoint and hence, again, only has the validity of this usually onesided form of presentation, interesting as it may be.

Rorschach, Hermann. *PSYCHODIAGNOSTIK.* [Ernest Bircher, Bern and Leipzig, 1921.]

W. Morgenthaler of Bern has begun a new series of monographs on Applied Psychiatry—*Arbeiten zur angewandten Psychiatrie*—with the coöperation of Jaspers of Heidelberg, H. W. Maier of Zurich, Repond of Malévoz, and Stransky of Vienna. A volume on the "psychotic as an artist" by Morgenthaler himself made up No. 1; the present volume is No. 2. Promised contributions are by Stransky on the "Psychopathology of Everyday Life"; Roffenstein on the "Psychology of the History of the Present"; Jaspers on "Strindberg," and Maier on "Cinematographs of the Mimic of the Psychotic."

The present volume is a contribution to psychiatric examination methods with some experimental studies with diagnostic significance. The foundation test of the studies is very simple. It consists in that game of allowing a blot of ink to fall on a piece of paper which when folded produces a fortuitous symmetrical pattern of some kind. The "interpretations" of this pattern constitute the *material* of the examinations. A group of these patterns accompany the monograph. The author first discusses the character of blots which should be selected. Some are too intricate and complicate the "Deutung." Symmetry is a necessary factor, he holds, to give the proper rhythm, although the asymmetrical patterns may have some special values.

"What can this be?" is the type of question put to the examinee

as the pattern is placed in his grasp without it having been seen from a distance, since distance and near associations are usually quite at variance the one with another.

The author next makes an effort to determine the psychological factors involved in the given significance to different individuals. He believes the tests to come within the "perception" and "grasp" factors of the experimental psychologists. A great number of persons, so-called healthy and mentally ill, were examined and the monograph consists in extensive analyses of the various answers, reaction times, negativisms, etc., which were evoked.

The details are too numerous to find a place in a review. Form, Movement, and Color factors first appear in the replies, with confabulatory, contaminated, detailed, intermediary and opposing complicating additions. Animal forms as "content" appear in a large number of answers, and another group specially discussed are the so-called "original" answers.

The author's analysis of what is called "intelligence" on the basis of these experiments makes an interesting chapter. It is not by any means convincing to the reviewer, or rather let it be said that it shows how far psychology, and hence psychopathology, is still removed from a satisfactory grasp of this extremely complex subject. Let it also be said that the experiments here discussed offer valuable data to such an analysis of "intelligence." This is made especially plain in the author's discussion of the significance of Jung's introverted and extraverted types, nomina which have come to have some value apparently in psychiatric fields.

The practical applications occupy about a third of the volume. Whereas the author states the experiments are not primarily devoted to obtaining data on unconscious processes, still such material is always present, and it may be very useful in diagnosis of neurotic from early or latent schizophrenic candidates. Although from the monograph's own showing this differentiation is very complex, yet certain definite values are shown. In this as well as in a number of diagnostic problems, not so very opportune, unfortunately, in the manic-depressive vs. schizophrenic field, the monograph contains a large number of penetrating and valuable suggestions for the neuropsychiatrist.

MacCarthy, Francis Hamilton. *THE HEALTHY CHILD FROM TWO TO SEVEN.* [The Macmillan Company, New York.]

This is a handbook for parents, nurses, and workers in child welfare. Its interest to the neuropsychiatrist lies not so much in the many chapters devoted to Air, and Clothes, and Food, as in the chapter on Steady Nerves and Healthy Mind.

There are 20 pages of the 230 or more devoted to this topic—to the reviewer's mind much too little in view of the fact that the human being is preëminently a social animal. When we turn to these chapters we are definitely disappointed. There is really very little there except words. The old, old chestnut about the "sound mind being dependent upon a sound body" is reiterated. When pediatricians will learn that a sound mind is the thing that makes a

sound body then some hope of training children beyond the high grade moron stage may be hoped for, not before. The undue importance of what is called health in the matters of air, food, clothes, play, etc., is the chief stumbling block in present pedagogics. It is not to be wondered at since the teachers, including the pediatricians, don't know enough about the mental parts of the human machine. It is not the pediatricians alone who are behindhand in these matters. The entire profession is too willing to go on teaching the many things which are not so instead of learning a few fundamental facts about human motives and cravings and their training.

Read, Carveth. THE ORIGIN OF MAN AND OF HIS SUPERSTITIONS. [University Press, Cambridge.]

The author is lecturer on Comparative Psychology in University College, London, and brings to his task a large stock of information with an evident knack of making it available to others.

The hypothesis of man's descent from some ape-like ancestor is freely accepted, but that human attributes such as brains and hands simply were useful and hence grew through the agencies of natural selection in true Darwinian fashion; this hypothesis Read has come to feel inadequate.

He therefore develops another in which the Hunting Pack, as the first form of human society, had to undergo some metamorphosis in order to develop into the settled life of the tribe. This weakening, Read calls it, of the hunting instinct, seems in some way related to the persistence of ideas of Animism and Magic, which superstitious attributes also had a use. Hence a magic working "gerontocracy" was a second stage in society and the Wizard King or the Priest King a third. These ideas the author traces in detail in the elaboration of his thesis, which is done in a most readable manner. Altogether a book to have and to read, thoroughly original and stimulating and not stodgy, nor overdogmatic.

Buscaino, Vito Maria. BIOLOGIA DELLA VITA EMOTIVA. Nicola Zanichelli, Bologna.]

A biology of the emotional life! What visions are opened up by the contemplation of such a title! Even before Darwin in his fascinating "Expression of the Emotions in Man and Animals," the efforts at making an intellectual appraisal of the emotional life, the feelings, have been numberless. Bergson in his inimitable way summed it up: "Doubtless it is with our entire past, including the original bent of our soul (phyletic engrammes, Mneme of Semon), that we desire, will, and act. Our past is made manifest to us in our impulse, it is felt in the form of tendencies, whereas *only a small part of it is known in the form of idea.*"

Buscaino would make another of these efforts of knowing something about this rich, instinctive sedimentation which has come to us out of the millenia of the past.

He starts with the "Somatic Expression of the Emotions as registered in (a) motor reactions in striated muscle, (b) motor reac-

tion in the vegetative life, cardiovascular, respiratory, digestive, excretory, kidney, etc.; (c) endocrine reactions of the glands of external secretion; (d) endocrine reactions; (e) variations in metabolism, sugar, carbon dioxide; (f) trophic disturbances. These are all summarized in orderly fashion following the older and some of the later day researches, chiefly the former, although a few of the later findings are sketchily abstracted.

Chapter 2 deals with the relations between the "subjective state and the somatic manifestations," a reprint of the author's excellent contribution to the *Rivista di Psicologia*, 1920, No. 2. The author's "subjective state" is one of purely conscious psychology, hence one does not expect to really get anywhere. We do not feel he touches the bottom anywhere in this chapter, the third, on the encephalic centers of emotional reflexes, also a reprint from an article in the *Rivista di Psicologia*, gives us a good platform from which to start, but it, too, seems to regard the reactions of the body as a whole as capable of being localized in a *place*. The grasp of the author seems lacking in what shall essentially be termed an emotion. Syllogistically he does not seem to get beyond (a) emotional states (subjectively estimated) produce polyuria; (b) lesions of the corpora mamillaria cause polyuria. Ergo: the seat of the emotional control of polyuria is in the corpora mamillaria. This is all too simple in a machine which has been elaborating its mechanisms a thousand million years.

"Physiopathology of the Emotions and Character" is his next chapter; "Pathogenesis of Psychic Trauma," "Hysteria and Traumatic Neuroses," "Dementia Praecox," succeeding chapters. Very illy coordinated are these with the central theme of the book. Chapter 9 deals with his summary and conclusions. An excellent bibliography completes this monograph, readable and authentic as far as it goes, but in the reviewer's opinion it fails to have large enough grasp of a difficult situation.

Dresel, E. G. DIE URSACHEN DER TRUNKSUCHT UND IHRE BEKÄMPFUNG DURCH DIE TRINKERFÜRSORGE IN HEIDELBERG. [Julius Springer, Berlin.]

"Trunksucht" is here dealt with practically in the English sense of "chronic alcoholism," although just where social drinking, as it were, ends, and chronic alcoholism begins, is by no means a definite matter.

The author avoids the usual discussions found in the mass of literature on alcoholism. He does not pretend to say whether alcoholic drinks should or should not be drunk, or sold, or manufactured; he does not preach about its use on any grounds, moral or social or biological. The subtleties of physiological or toxicological issues are not entered into. He simply has attempted a careful personal investigation of a certain number of chronic alcoholics that have come within the attention of the police, the psychiatric clinic, the poor-house, or the organized bureaus in Heidelberg dealing with the many issues arising out of the misuse of alcoholic drinks. There are 151

of these which are reported upon in this monograph, No. 5 of the *Abhandlungen aus dem Gebiet der Kriminapsychologie*, edited by Lilienthal, Schott and Wilmanns. Wilmanns, Nissl's successor in psychiatry at Heidelberg, who has given such excellent studies of the Tramp and the Psychopathies, is the stimulus to the present study, since his general outlines of classification of Psychopathic Types is followed.

The monograph deals first with the homes and parents of the drinkers; then the occupations, their own family life, the children, food conditions, housing of those studied.

Statistics as to the involvements of the social machinery in its various branches through such chronic alcoholics are then discussed.

The character make-up grouping of the different individuals then follows, and a later summary of the general therapeutic results of the different social services is offered. An interesting statistical analysis of the relationships of age incidence of the drinkers to the severity, the prognosis, the gravity of social misfitting, etc., then follows. At least 107 of the 151 individuals belonged in different definitely psychopathic groups. Of the 151, 108 had come before various officers of the law, and a detailed account of the criminal acts is given. The author rarely allows himself any generalizations, but from his many sided attack upon the criminal aspect of the problem he states that "*alcoholism alone is not responsible for the criminality; it is rather the psychopathic personality which lies behind it that causes both the chronic alcoholism and the criminality.*" This conclusion is in line with most modern neuropsychiatric teaching that alcoholism is a symptom of a disordered character make-up rather than a cause of it.

The rest of the monograph, 40 of its 120 pages, is taken up with the careful histories of the patients studied. These are given in abridged form; the many details, the author stating, being preserved in mss. in the library of the Heidelberg University, since the cost of printing and paper does not justify their complete recording.

This is a model type of investigation of this class of problem from the conscious levels, and all interested in this foremost of social problems can read it with pleasure and profit.

Guillaume, A. C. LE SYMPATHIQUE ET LES SYSTÈMES ASSOCIÉS. Deuxième Edition. [Masson et Cie, 1921.]

We have had occasion to speak encouragingly of the first edition of this work, almost the first attempt at a monograph on the vegetative nervous system by a French author. Although it was somewhat sketchy its foundations were excellent and it is a pleasure to note that neuropsychiatric interest is so keen on the neurological mechanisms which underlie the metabolic activities of all the organs of the body, in French reading countries at least, that a second edition was called for within a year of the appearance of the first.

This has given the author an opportunity to present a volume worthy of the subject and more truly indicative of his own grasp upon the subject.

It is an excellent performance and is to be specially commended to all students of medicine who wish to get at a biological view of the vegetative nervous system.

The reviewer still uses the term vegetative although the author rejects it on the puerile ground, in which he apparently follows Langley, that the word vegetative applies only to plant life. Why not reject sympathetic because it refers to "sympathies"? Vegetative really means referring to growth and nutrition and this is what the vegetative system regulates.

Guillaume states this, and uses the phrase "organo-végétative," even though Langley denies that what he prefers to call the autonomic system has nothing to do with metabolism. Aside from such a minor verbal obscurity the author treats of his "sympathetic system" as a vegetative system, coördinating the body as a whole in its metabolic activities.

We have only one criticism of this really excellent work: that is its failure to duly emphasize the great importance and close relationships which exist between the vegetative system and the symbolic activities of the human being as manifested in the struggle for individual existence and phyletic evolution.

It is an extremely readable and suggestive volume and we feel assured that a third edition will be needed, which, should it show as much evolution as has this edition from the first, promises to be a masterpiece.

Pilcz, Alexander. LEHRBUCH DER SPEZIELLEN PSYCHIATRIE, SECHSTE VERBESSERTE AUFLAGE. [Franz Deuticke, Leipzig and Wien.]

This excellent textbook has found enduring favor since its first edition in 1904. In many respects it remains practically as it was in its third or prewar stage. The author says that the war brought few really novel ideas, but it did deepen and widen the psychiatric grasp upon the hosts of problems which neuropsychiatry had been working upon in the past few decades. The importance of unconscious factors was much more clearly comprehended and elucidated.

Pilcz groups his material as follows: I. Acute Functional Psychoses, including (a) Melancholia, (b) Mania, (c) Amentia and acute delirium. II. Chronic Functional Psychoses: (a) Paranoia, (b) Periodic Psychoses. III. Alcoholic Psychoses. IV. Dementing Processes: (a) Paresis, (b) Senile Dementia, (c) Anteriosclerotic Dementia, (d) Psychoses with Brain Disease, (e) Dementia Precox. V. Thyroid Psychoses. VI. Psychoses associated with Major Neuroses: (a) Epileptic and Hysterical Psychoses. VII. Congenital Defect States, and XIII, Psycho-inferiority.

Excellent descriptive accounts enlarge upon these formulations. They are concise, yet full enough to do justice to the subject for the purpose for which the book is written. In most respects the general attitude is Kraepelian, although Pilcz does not sink his individuality behind an imitative following of the Munich school. At the same time we find a little too marked an insistence upon "diseases" *per se*

as contrasted with a more plastic comprehension of process trends. This didactic form may be best for student purposes. We doubt it, but that is a matter of opinion. All in all, this new edition makes an excellent showing and is to be heartily recommended.

Müller, L. R. UEBER DIE ALTERSCHÄTZUNG BEI MENSCHEN.
[Julius Springer, Berlin, Mk. 33.]

L. R. Müller, who in recent years has offered much profitable work on the vegetative system, has here collected in a small monograph of 62 pages an extremely suggestive and striking series of observations on the signs of getting old. It is his inaugural dissertation to the chair of internal medicine and director of the medical clinic at Erlangen.

It forms part of a series of studies concerning the relationship of the metabolic activities of the individual to age. The estimation of the span of human life, the judgments of the age of a race, the causes of growing old and the cell changes in the aging, these are contributory studies which are woven into this very careful series of observations.

Changes in the skeleton, in the fatty deposits, in the skin, the eyes, ears, the mouth, the hands, the genitals, are all described and extremely well illustrated by excellent photographs extremely well reproduced. Then follow the discussion of the topics here indicated in the opening of the paragraph. Not the least interesting of the topics discussed all too briefly is that dealing with the changes in the "soul life" of the aging individual.

Altogether a very fine piece of work, short and clear, and well worth while.

N. B.—All business communications should be made to *Journal of Nervous and Mental Disease*, 64 West 56th St., New York.

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ORIGINAL ARTICLES

DIFFUSE SCLERODERMA WITH CONCURRENT PSYCHOSIS

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The concurrence of a rare skin lesion and an interesting mental disorder seems worthy of record even though the nature of the relationship is obscure and possibly no more than coincidental. The case is as follows:

Concetta Y., an Italian woman, aged thirty-five, was admitted to the Chicago State Hospital November 26, 1919; married, the mother of six children and with a history of two miscarriages. She had been healthy and a good housewife; elementary education. The family came to Chicago from Utah in December, 1918. The patient's acute mental illness began September 1, 1919, although prior to this time she had worried much about the family finances, feeling that they had not bettered themselves by moving to Chicago. With the onset of her illness she worried still more and began to doubt her husband's fidelity and her daughter's honor because this young girl of seventeen had to work in order to help support the family. At this time she probably had no skin trouble, but the daughter states that at times "*the blood in her fingers turned blue and that she was treated for anemia.*"

For two weeks she was treated at home and in bed. It was difficult to keep her in bed, however, because she thought that the woman upstairs was trying to lead her daughter astray; fancied there was fire in the basement; that the family was to be destroyed, etc. She even tried suicide with iodine. She knew members of the family and knew where she was. She also heard voices saying they would give her money and these voices she tried to follow out of the house. She was not personally unclean but was said to be irritable and quarrelsome when not allowed to go out. She even called her daughter vile names; thought people were stealing from her and

that her food might be poisoned, on which account she insisted that members of her family try the food first.



Fig. 1.

Upon admission she weighed 100 pounds; normal weight said to be about 130; blood pressure (systolic) 110; knee jerks active; *brownish discolorations on legs*; Wassermann reaction and urine

negative. Upon examination one week after admission she was said to be "resistive, mute and spoon-fed." She spoke very little, even to her friends, and was said to show some tendency to "catalepsy." She was sent to the hospital ward because of her poor physical condition and was undiagnosed because of a variety of symptoms difficult to classify. Upon this ward she was said to be "indifferent and without physical findings."

She was again presented June 12, 1920, when she was reported to be "seclusive," to lie upon a couch on the ward and to be improved physically. She resisted introduction into the occupational therapy class, ate with relish food her relatives brought but had little to say to them. She admitted hearing voices telling her her children were dead, that they were going to take her away and chop her into bits, etc. She did not know why these things should be done; had no ideas of unworthiness; showed no agitation but said her mind was "unbalanced." A diagnosis of dementia praecox, catatonic type, was made.

She was paroled November 23, 1920, without further notation except that her skin was said to be "thickened" at this time. She was returned February 23, 1921, with a history of being in the County Hospital with an eruption which did not require treatment. The daughter states that when she was taken from the State Hospital she had a skin disease which others of the family contracted (probably scabies). When returned from parole she was said to be mute and resistive and to have sugar in the urine (a finding not since verified). When found upon the ward by the writer in August, 1921, the patient was suffering from a diffuse scleroderma of considerable duration but very unfortunately unobserved.

The daughter of sixteen, when questioned on September 4, 1921, said the patient seemed about as usual; that she still talked about Utah and would say, "Look at what a condition we are all in. Where is my man?" etc., and still worried about her children. The daughter thought she had grown darker during the last four months and that she had had no spots on her (leucoderma) when she was returned from parole, six months before. A sister who was also employed as an interpreter and for purposes of information, explained that the patient always asks for her husband who ran away from her a year or more ago. She often tells the sister that if she had known that she was to come to such a condition as she is now in she never would have believed it. She wants to be taken home; notices other patients writing and wishes to write for her people to come for her and for death to take her. She often says, "I never thought I would turn out this way."

Present Physical Condition: The patient is an Italian woman of slight stature and indeterminate age. She stands or sits with shoulders stooped and wears an expression of profound dejection. There is a slight frown and the mouth is small and puckered, bird-like. The left ear shows a chronic dermatitis with crusts, scales and a general induration. The right ear is negative. Patient's color is very dark, even for an Italian woman, and there are spots of leuco-

derma on the forehead, over the chest, on the backs of the hands and on the legs. There is also a reddish mottling especially noticeable over the chest and abdomen.

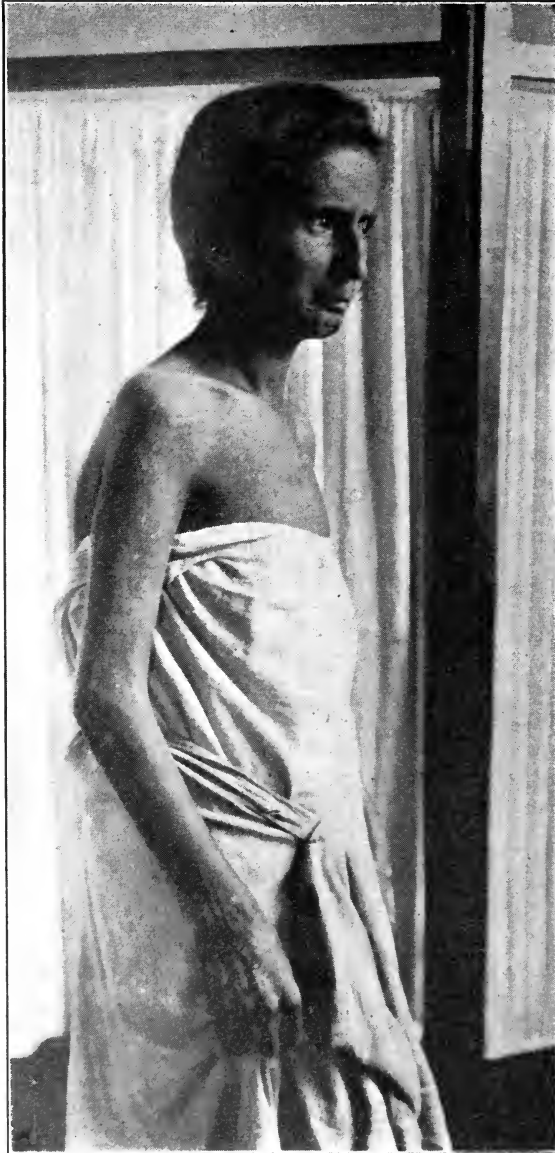


Fig. 2.

The skin of the forehead is that of an old person (patient is thirty-five). About the mouth there are numerous little folds. The

cheeks have a leathery consistency that is not noticeable about the neck. Patient is somewhat emaciated, weighing 100 pounds, against what is said to have been a normal weight of 130 pounds. There is no marked change about the shoulders nor over the chest posteriorly. Anteriorly there is a noticeable thickening of the skin from the clavicle down, especially over the mammae which are atrophied, a board-like or leathery induration. The left arm can not be elevated at the shoulder to a horizontal position nor can the forearm be fully extended at the elbow. The right arm can be raised so that the patient could do her hair if she so desired. In moving the arms about the patient resists considerably, resenting the interference and moaning a little at times as if hurt. The arms are so atrophied as to have lost their natural curves. The circumference just below the shoulder is practically the same as below the elbow. The wrists are very small and mummy-like, as if the skin and flesh had dried on the bones. The same is true, to a less extent, of both forearms.

The hands are most interesting and are practically identical in appearance. The fingers are considerably flexed at the second joints and cannot be entirely straightened. They are claw-like and end in a bulb which approximates the half of a sphere. The backs of the hands show much leucoderma. The skin of the palms is dry and firm, but apparently not involved like that of the backs. Upon the palm of the left hand there are a few spots where the epidermis has been removed, leaving the reddened surface below. The skin from the breast down to the pubes is thick, pigmented and at the same time reddened in patches. The lower extremities are much less affected than the upper. There is the same pigmentation, reddening and leucoderma in places but the skin is not so thickened and the feet themselves are quite normal in appearance. The soles are negative. On the outer surface of the right foot is a small ulceration similar to those described on the palm of the left hand. Both knees can be fully extended. In examining the lower limbs it would seem that the patient is resistive, probably for reasons of modesty, inasmuch as she promptly covers herself up when the examiner removes his hands.

Neurological examination is negative: Urinalysis shows S. G. 1015 faintly acid, albumin a trace, solids 3.50%. The blood count yields 8700 whites and 4,230,000 reds (!), haemoglobin 85%, 65% neutrophiles, 4% eosinophiles, reds apparently normal to stain: A negative picture save for concentration and increased eosinophiles.

Present Mental Status: Patient exhibits no sponaneity. She looks about her slowly with a woebegone expression. There are no peculiarities of conduct, no evidences of hallucinosis. She never smiles. There is very little agitation, if any. Through her daughter she states that she feels stiff in the joints and in the back and that her skin burns and itches. She thinks that her skin has felt this way for a year. The spots on her hands she thinks are due to burns in a hot bath; thinks her skin has been brown for a long time. She recognizes the ward doctor as such and knows she is in a hospital. When asked how long she has been in the hospital, replies that she

has been here once before and was paroled 6-6-20 (approximately correct). When asked the present month and year she looks at the calendar and replies correctly. When asked how she feels she replies, "All sick, all sick." She hears no voices and has no ideas concerning poison, hypnotism, etc. When asked if she worries about anything she replies, "I am lonesome," and when asked why this is she replies, "I want to be with my children." Asked if she has been a great sinner she replies, "We all sin," and when asked if there is anything more she wishes to say, replies, "I feel too sick. I cannot talk much." When asked if there is anything she wishes



Fig. 3.

to do she replies, "I want to get out of here, but don't know where to go."

There is evidently a depressed mood which, together with a poverty of ideas and a certain degree of stereotypy, strongly reminds one of old cases of involuntional melancholia.

The case is interesting for three reasons: First, diffuse scleroderma is a rare condition of doubtful etiology, possibly of nervous origin. Second, the presence of this pathology in a subject with a psychosis naturally gives rise to a query concerning their relationship. And third, the character of the mental disorder presents a pretty diagnostic problem in itself.

The patient was diagnosed dementia praecox at the county psycho-

pathic hospital and has been twice presented at state hospital medical staff meeting as a case of dementia praecox by an examiner of experience and psychiatric judgment. This diagnosis was not accepted at first because of a multiplicity of oddly assorted symptoms, but the second time it was agreed to unanimously upon the following summary by the examining physician:

"The failure of the patient to improve mentally with a very marked improvement in her physical condition would suggest the diagnosis of dementia praecox. The presence at times of mutism, resistiveness, seclusiveness, apparent lack of interest and impulsiveness, all would tend towards a diagnosis of katatonic dementia praecox. The depressive hallucinosis (onset) might be suggestive of depressed phase of manic-depressive insanity, but the absence of a corresponding feeling tone(?), and the absence of expression of the same in agitation would incline the examiner to a diagnosis of dementia praecox."

Here apparently are the hallmarks of dementia praecox and yet the patient has been much depressed and still is depressed though, it must be confessed, in a stereotyped manner suggestive of the involitional period rather than the age of thirty-five. There is little spontaneity, seemingly a paucity of ideas and little if any agitation. General descriptive terms such as *mutism*, *violence*, *resistiveness*, *refusal of food* and *seclusiveness* mean little in a differential diagnosis unless they sum up very careful observation which is embodied in the case record so that the examiner's conclusions may be checked by others. Many depressed cases are almost mute; food may be refused for many reasons; resistiveness may arise from misunderstanding and fear; seclusiveness from absorption in depressive ideas, language difficulties, etc. In this case report, however, it should be remarked in justice to the examiner that apparently every effort compatible with time limitations was made to obtain from the patient an explanation of her behavior and all with very meager results.

Mentally and physically she is not so much unlike Tanzi's description of old pellagrins who are, he says, "as a rule, depressed and dull brained, speak little and in a low voice and in their appearance suggest dejection and resignation." Also other physically descriptive terms used in connection with pellagra are not without application to diffuse scleroderma; *i.e.*, such as acute erythemas, emaciation, pigmentation, contractures, etc. The analogy, in view of the uncer-

tain etiology of both mental states, is at least interesting though there can of course be no question of identity.

Whitehouse, as quoted by Sutton* reports positive Wassermann reactions in cases not presenting other signs of lues and thinks that



Fig. 4.

syphilis may give rise to cord disturbances which ultimately produce cutaneous changes. However, Sutton himself believes the affair to be a trophic neurosis depending upon changes in the brain rather than in the cord and the same opinion is apparently shared by Ormsby,† who quotes Sequeira as attributing the changes to central

* Diseases of the Skin, 1919.

† Diseases of the Skin, 1915.

ganglionic lesions acting by vasomotor or trophic influences. Ormsby mentions among other predisposing causes grief, anxiety, etc. Durkin‡ quotes three cases in two of which mental depression occurred subsequent to the skin involvement and places the responsibility rather indefinitely upon the nervous system which is "more or less involved."

Has the patient's general condition an etiological significance as related to her mental state? At thirty-six she has lost all the spontaneity and freshness of youth. Physically she is an old woman, thin, stiff and slow of movement. Mentally she is lethargic and stereotyped, but is she a praecox? It must not be forgotten that before her mental illness began she was treated for a periodic cyanosis of the hands and "anaemia," very possibly the earliest manifestations of her scleroderma.

‡ Journal of Nervous and Mental Diseases, July, 1896.

A NOTE ON THE RELATION OF THE AXILLARY ARTERY TO THE BRACHIAL PLEXUS

BY WALTER M. KRAUS, A.M., M.D.

NEW YORK

A. *Introduction.*—The brachial plexus is not a very simple structure. However, the use of a bit of anatomical information may serve to make its complicated branching very much easier to remember.

The division into dorsal and ventral branches.—The first fact of importance is that it is composed of branches which may be divided into ventral and dorsal groups. These ventral and dorsal branches arise in the ventral branches of spinal nerves. If, for the sake of simplicity only the five main branches which go to the muscles and skin of the arm, forearm, hand and fingers are considered, we find that these may be divided into two general groups, the circumflex and musculospiral on one hand, the musculocutaneous, median and ulnar on the other. If we represent these two groups separately we get pictures which are shown in Figures 1 and 2.*

B. *The part played by the axillary artery.*—Figure 3 shows a more complicated interlacing. This is readily understood, however, by the second anatomical fact which is the one to be emphasized. The axillary artery is at the bottom of the complexity. If we assume that the axillary artery were differently placed than it is, that it did not pass between the two heads which make up the median nerve (Fig. 3) it will be seen that the ventral nerve of the arm, forearm, hand and fingers, that is, the combined outer and inner cord, would be fused and as simply constituted as the dorsal nerve, the posterior cord. The direction of fusion of nerves is always towards the axis of the central nervous system, just as the direction of branching is always away from it. It is quite obvious therefore, that the presence of the axillary artery accounts for the lack of fusion and hence the complexity. The musculocutaneous, median and

* NOTE.—The reader will find the following an excellent article on the normal and abnormal structure of the brachial plexus: "The Brachial Plexus of Nerves in Man—the Variations in Its Formation and Branches." Abram T. Kerr. *The American Jr. of Anatomy*, Vol. 23, No. 2, March 15, 1918, pp. 285-395.

ulnar nerves are but branches of the ventral nerve dignified by special names. The circumflex and musculospiral nerves are but

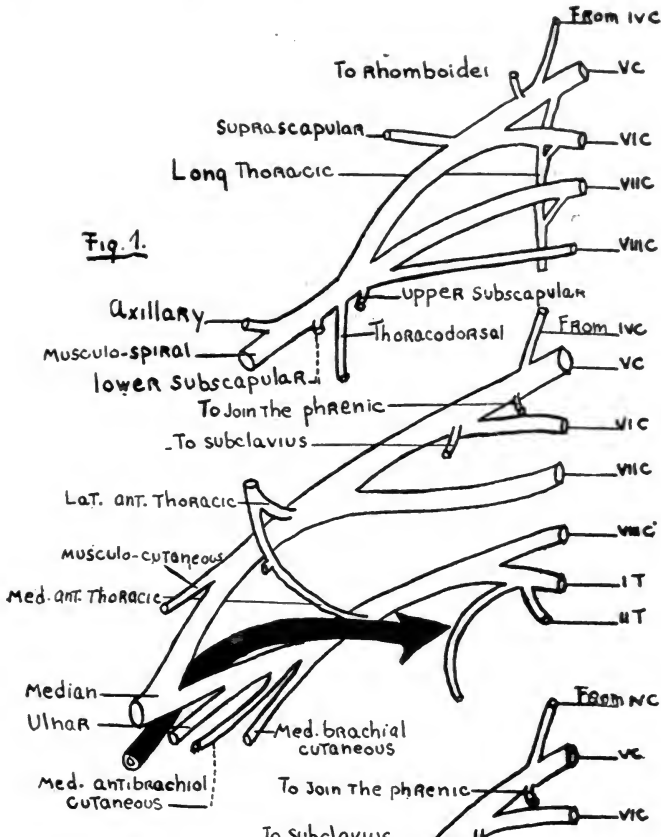


Fig. 1.

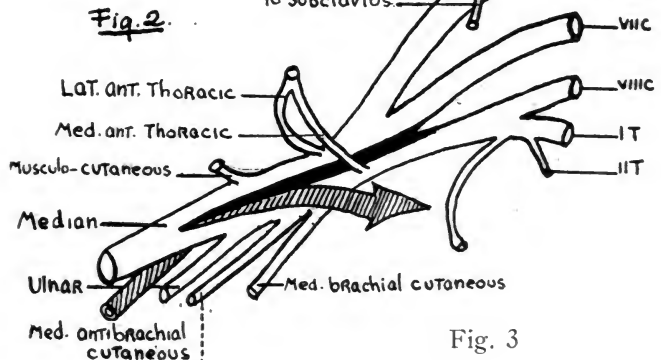


Fig. 2.

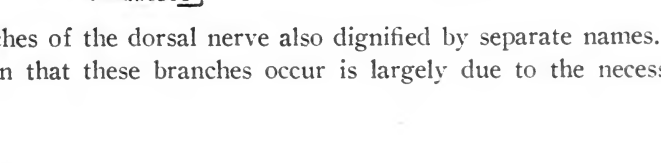


Fig. 3

branches of the dorsal nerve also dignified by separate names. The reason that these branches occur is largely due to the necessity of

supplying *topographically distant* structures, that is, the muscles of the shoulder on one hand and the muscles of the arm and forearm on the other.

KEY TO DIAGRAM (p. 323)

Figure 1 represents the dorsal trunks and branches of the brachial plexus. The fusion into a single branch, the posterior cord, is shown.

Figure 2 represents the ventral trunks and branches of the brachial plexus. The axillary artery is represented by the black arrow. The way in which it prevents fusion of the two heads of the median is illustrated by the course of the artery.

Figure 3 is schematic and shows what would happen if the axillary artery were absent. The black area between the upper and lower cords indicates their fusion, which would occur if the artery were not present. These two cords would then form a single ventral cord like the dorsal or posterior cord illustrated in figure 1.

The diagram illustrates the principle that the direction of fusion of nerves is always towards the axis of the central nervous system while the direction of branching is always away from it. These two activities are constantly at work. As a result, extremely complex internal nerve plexuses are produced.

The position of the axillary artery represents one of the many anatomical deterrents of fusion centralward of peripheral nerves.

THE SYNDROME OF LILLIPUTIAN HALLUCINATIONS

BY RAOUL LEROY

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For about ten years, I have tried to bring to the fore a new syndrome of visual hallucinations called lilliputian, of which the character and pathogenesis are, I believe, worthy of attention. It is the vision of small people, men or women of minute or slightly variable height; either above or accompanied by small animals or small objects all relatively proportionate in size, with the result that the individual must see a world such as created by Swift in Gulliver. These hallucinations are mobile, colored, generally multiple. It is a veritable Lilliputian vision. Sometimes it is a theatre of small marionettes, scenes in miniature which appear to the eyes of the surprised patient. All this little world, clothed generally in bright colors, walks, runs, plays and works in relief and perspective; these micropsic visions give an impression of real life.

The patient conceives these hallucinations apart from any micropsy even when he has a normal conception of the size of objects which surround him. Thus it is he sees those lilliputians pass by on a table, a wall, a floor, being perfectly conscious of his own surroundings and of where the scene is enacted. The coexistence of micropsy has never been noticed in any observation. These two orders of facts are distinct and should not be confused.

It is to be noted that these particular visions are accompanied ordinarily by a pleasurable state of mind, while the majority of visional toxic hallucinations produce a painful impression. The patient watches with amusement this lilliputian spectacle unfold itself beneath his eyes.

As in the majority of hallucinations of sight, one rarely notes the coexistence of audition hallucinations. However this is not absolute. The subject sometimes hears the small people speak, when the voice assumes a lilliputian tone.

Before my publications, the micropsic visions although far from being rare, had scarcely ever been studied. Perhaps it is because they are not frequent in asylums. As a matter of fact, they can

¹ I owe this translation to the kindness of my friend, W. N. LeNansois-Field, B.A., teacher at City of London School, to whom I am greatly indebted.

exist apart from any mental malady and may occur just as well in people suffering from commonplace toxic infections as in the psychotic.

For some years past, a certain number of cases have been published in France; they prove that in the hallucinations of a toxic delirium side by side with terrifying and painful classic visions there certainly can exist a syndrome of lilliputian hallucinations with its particular characteristics.

Sometimes it is to be met with alone, apart from any mental trouble and any pathological defect. It is equally observed mingled with the chaos of dream delirium, or even it precedes or follows them. Finally it may occur in atypical form. In rare cases the vision is cinematographic.

Typical Lilliputian Hallucinations. It is certainly in the pure state that the syndrome is most curious. The following is an example in a patient presented by R. de Fursac and myself before the Society of Psychiatry at Paris. A man, suffering from chronic alcoholism in a subacute paroxysm related the following: "The evening of the day that I became ill, I was astounded and amused to see appear, on a kind of ledge going the round of the room formed by beams situated at some distance from the ceiling, about a hundred little men and women about six inches in height. They wore yellow, red or blue trousers and skirts. The men had a kind of fez and the women wore bonnets. Certain of them were mounted on small bay colored horses proportionate in size. All this little world in miniature walked, stopped, gesticulated, turned round and appeared to be speaking without my hearing any sound. These personages gradually disappeared and departed in columns at the end of half an hour."

Some hours before the apparition of this vision, the patient had had the commonplace toxic visual hallucinations. He had seen the ceiling of his bedroom pierced by a wimble at the end of which were attached iron wires which swung about in the room and almost upset the clock, two large monkeys were on the wardrobe, one of them even wanted to saw; he had tried in vain to drive them out. This man was so moved and so terrified by the wimbles from the ceiling that he went to find his landlord in order to complain of the tenant living above him.

This observation shows clearly the special character of the two opposite varieties of hallucinations from the affective point of view. The ordinary toxic visions produce a feeling of fear and terror; lilliputian visions are accompanied, on the contrary, by a feeling of curiosity and amusement.

Alfred de Musset himself has manifested like psychosensorial troubles and I propose to give here the greater part of this case, because of the personality of the sufferer.

Paul de Musset himself has related that his brother Alfred had inflammation of the lungs for which he was attended by Chomel. Then he adds: "During the decline of the illness, I witnessed a rather strange phenomenon. We were seated one morning, sister Marcellin and I, by my brother's bed. He appeared calm and somewhat depressed, his reason was struggling against the delirium caused by insomnia and by a trace of congestion of the lungs; visions were passing before his eyes, but he had a clear idea of all these sensations and he kept on questioning me in order to distinguish the real from the imaginary objects. Guided by my replies, he analyzed his delirium, observed it with curiosity, derived amusement from it as from a spectacle and described to me the images which took form in his head. Soon his mind composed complete pictures, one of whose moving pictures has remained engraved in his memory and in mine as well. It was during the month of March, the sun was shining in the middle of the bedroom on the little work table which happened to be covered with phials. In spite of the litter on this table, the patient saw it again in the state in which he had left it when he took to his bed, that is to say, stocked with papers and books, with the ink stand and pens arranged symmetrically. Soon four little winged genies took possession of the volumes, the papers and the ink stand and having cleared the table brought the phials and medicaments in the order that they had arrived from the chemist. Their work finished, the genies went away, they had just left the room when the poet passing his table in review said 'That is not quite right, there was some dust in various places, notably in the Chinese lacquer ink stand.' Scarcely had he expressed this just subject of complaint, when he perceived a little man three inches in height and carrying on his back the stone jar of an itinerant vendor of liquorice water. This lilliputian walked about over the ink stand and books all the while opening the top of his jar out of which came a fine dust, so that in a few minutes the desired order of things reigned on the table. 'That is perfect' said the master, drawing his blankets over his eyes, 'Now I can sleep and I verily believe that I am cured.' Indeed he was, for on awakening his rested mind had regained the calm and lucidity of its normal state."

The dream of Alfred de Musset is admirably traced and the author has even written the word "lilliputian" to characterize the little man, who immediately comes to sow in the books the dust de-

manded by the poet, an interesting fact which shows the intimate relation existing between the hallucination and the present preoccupation of the patient.

Principal Affections in which the Syndrome is to be found.

There are scarcely any mental maladies, toxic or toxi-infectious states where one cannot find the syndrome. It is to be met with in febrile delirium [typhoid fever, cholera, erysipelas, pneumonia, purulent pleurisy, etc.] in chorea and other infections.

Above all it is in alcoholism that we have pointed it out, and this is easily explained since ethylic delirium is the type of dream delirium. Nevertheless, it is curious that no books speak of it. Some rare authors refer to it incidentally, without attaching to it the importance it deserves and without speaking of its particular character.

Kraepelin,² notably, says this: "These visual hallucinations assume often also a singular character; the patients see men made of glass, of water, objects made of inflated gold beater's skin, small lilliputian people [winziger Männchen], on or in water likewise quite small, will-o'-the-wisps. In the midst of it all indifferent or pleasant hallucinations insinuate themselves anew. They are luminous discs, blue or green, flames, sparks, a regiment of infantry, of artillery, generals, horsemen, theatrical scenes, long and wide processions of bedizined people, smiling girls. . . . In all this filing past there is a great agitation. The little men sneak under the furniture, climb on ladders, the military gallop to an assault and maneuver in the room; quite small sweeps come out of the stove door, one of them makes the patient sneeze. They go and feast themselves in the adjoining room and then jump out of the window." [1]. In this enumeration of hallucination troubles, of which I have only taken the characteristic passages, one easily recognizes the presence of lilliputian syndrome.

I owe to the kindness of Professor Pierre Duval, a very interesting observation. A music hall dancer is brought to the Lariboisiere Hospital, as a result of a violent fall down a staircase, senseless and smelling of alcohol. The immediate sounding of the wound does not indicate any fracture, normal cephalorachidian liquid. The following day, violent pains in the head, temperature in the morning 37.6° C., in the evening, 38.2° C., large ecchymosis, nocturnal agitation. Two days later, appearance of mental trouble. The patient sees her pillow swell up and turn into wicked men who wish to kill her, she says that men come into her bed to assassinate her. Temperature in the morning 37.9° C., in the evening 38.2° C., pulse 120. Now and

² Kraepelin, E. *Psychiatrie: Alcoholismus.*

again, she sees for the first time visions quite different and pleasant, which rest her from her terrors. She sees little men all clothed in red, little gypsies, twelve inches high, three in number, two are standing playing the violin, one seated before a piano. They play animated dance airs, sometimes rise to fetch her, make signs to her to come and dance with them. They do not frighten her and the patient laughs in speaking of this vision. The patient is trepanned by M. Duval who finds an extra dural effusion of blood. The following days the fever continues, suppuration, headache, disagreeable visions of animals and assassinations; sometimes reappearance of the little pleasant musicians with their music. Later, the patient sometimes sees very roguish little people, at other times the little musicians not quite so tall as formerly from two to four inches only. This observation clearly indicates the professional character of dream delirium, and the agreeable affective state has assumed a curious form deserving of attention.

Intoxication by ether, alcohol, cocaine, hasish, may occasion equally lilliputian hallucination. The writer, Théophile Gautier relates even that thanks to hasish, he had been able to describe the portrait of an elf true to nature. Opium does not give rise to the same phenomena.

It is not only in infections and exogenous intoxications that the syndrome is met with. I have observed it in arteriosclerotic patients, in senile people, whether psychotic or not. An old man, suffering for several years from acute articular rheumatism, cardiac and renal trouble, during two consecutive winters saw from time to time, long trains of little people from six to seven inches high, in gala clothes, walking in two files like processions. These little people entered by the window, advanced along the front of a wardrobe finally to disappear into the frieze of the wall paper. That happened chiefly in the twilight in the shadow and also at night. The gambols of these lilliputians amused him and made him laugh, except during the night when the patient considered these processions out of place.

Fasting, inanition, may explain likewise the minute hallucinations of certain mystics such as the examples that one find in the history of the "Lives of the Saints," "Saint Macarius," a solitary of the IVth Century, and "Joan of Arc".

The syndrome is observed also in dementia. It often assumes an abnormal character, by reason of the superadded delirium or of the intellectual weakening of the patient. It is thus, for example, that the affective state may show itself indifferent or disagreeable. In

pareisis notably, although the psychosensorial troubles may be exceptional, several French authors have shown the existence of lilliputian hallucinations in the dream form of this affection. The first patient that I observed was a paretic who in the midst of an hallucinatory delirium following on an epileptiform convulsion saw some small soldiers four to six inches high file by in close battalions, some little men dressed in gaudy colors running about on the marble mantle-piece, some small dancing dolls, some small cyclists. The patient evinced little surprise at these visions which made him laugh out loud. It seems that the syndrome exists in dementia precox sometimes at the beginning.

Lilliputian Hallucinations in Hypnagogic States. The auto observation of Maury³ is derived from lilliputian syndrome.

He says: "Happening to ride in a stage coach, in 1843, on my way to Switzerland, via Mulhouse, I experienced one of the most remarkable hallucinations with multiple images that I ever witnessed in myself. Jaded by two nights traveling in the coach, about one o'clock in the morning, I fell into a dreamy state preliminary to sleep. I closed my eyes unthinkingly. I could still hear the noise of the horses, the talk of the post boys changing them, when a swarm of tiny figures, ruddy and shiny, moving about in a thousand different ways seeming to converse together appeared to me. The vision lasted more than a quarter of an hour. It came back to me several times and only vanished altogether when I reached Belfort. I then arose. I was very much flushed, the blood pouring into my head."

M. Mignard has cited the case of a colleague, who, during the great war, while struggling against sleep during a night march at the front, saw a troop of little gnomes clothed in curious costumes and brightly colored, advancing towards him along the road.

Lilliputian Dreams. Lilliputian visions are not rare in dreams, although few authors speak of them in an extensive bibliography. My late medical student, M. Fasson, has published a very fine case of lilliputian dream in an alcoholic. During his sleep the patient imagined himself seated in a railway compartment and looking out of the window, saw, all at once, a host of little people as tall as a finger, running in all directions shouting, playing at football, with a ball as large as a nut. They were wearing clothes of varied colors, blue, red, but chiefly greyish green. At the first stop about twenty of these minute personages mounted to the top of the carriage and gave

³ Maury. *Le sommeil et les rêves*, 1878.

themselves up to all kinds of acrobatics. One would have said they were clowns. This scene was very amusing.

Psychological Interpretation. Lilliputian hallucinations appear to me to have a real importance in elucidating the pathogeny of hallucinations by showing clearly the double intervention of cortical centers and of the psyche. These psychosensorial troubles occur in toxic or infectious states, when the centers are excited by any kind of poison which at the same time has a perverting action on the conscious mind. The existence of the lilliputian syndrome in the hypnotagogic states is very interesting on this point. This irritation sets up an action of the psychism and it is with the elements of the sub-conscious and unconscious that the hallucination is formed, a veritable delirium, as M. Séglas has so well said.

We have shown the existence of dreams bearing upon minute personages. According to Ch. L. Smith, the musing of young children concern almost exclusively, fairy games and fairy tales. Besides have not dreams and madness been identified from time immemorial? The work of Freud has only confirmed the enormous rôle of the unconscious in the formation of dreams and of delirium. This explains why the lilliputian syndrome either pure or mingled with a whole phantasmagoria of which the dream gives us an example, exists in dream delirium. It had scarcely been noticed up to the present; now that attention has been drawn to the point it is met with frequently.

The agreeable character remains to be explained. Is it because the visions are small and consequently inoffensive? Rather is it because the patient has created, with his subconscious mind, a little world, colored, amusing and whose gambols brighten him up. This seems so true that in the rare cases where the microscopic hallucinations are painful, the vision is black and the patient speaks of little horned and malevolent devils [Macario]. There again the affective state and the visual hallucination have absolutely the same character.

If among doctors, the lilliputian syndrome has passed almost unnoticed, one finds it extremely frequent in literature, where it deserves to be studied. Without speaking of the immortal work of Swift, whose travels to Lilliput have furnished me with the name of the syndrome; without speaking of fairy tales, of legends, of pigmy stories, of goblins, etc., I shall cite in passing, two examples. The novels of Anatole France⁴ contain without a doubt, several typical passages concerning these troubles. The author seems even

⁴ The Crime of Sylvestre Bonnard.

to have conceived the relation of them with dreams. There is one passage among others: "To come back to the point where I was, he says, I was vaguely conscious that a heavy drowsiness was weighing on my mind. . . . I could not say for how long my eyes had riveted without cause on an old folio, when they were captivated by a spectacle so extraordinary that a man totally lacking in imagination as I am, could not otherwise than be vividly struck by it. All at once I saw, without having perceived his arrival, a small person seated on the back of the book with a knee bent and a leg hanging practically in the attitude that the Amazons of Hyde Park or of the Bois de Boulogne assume. She was so small that her dangling foot did not reach the table on which the tail of her dress was spread out in folds. But her face and her form were those of a full grown woman. The fulness of her blouse and the roundness of her hips left no doubt on this subject, even to an old scholar like myself. . . . It may seem strange that a person as big as a bottle and who would have disappeared in the pocket of my frock coat, if it had not been disrespectful to put her there, should give precisely the idea of greatness. But there were in the proportions of the lady seated on the 'Chronicles of Nuremberg' such a proud elegance and such a majestic harmony, she had at once an attitude so easy and so noble, that she appeared great to me. Although my ink stand, which she was considering with a mocking attention as though she could read in advance all the words which were to come out of it from the end of my pen, was for her a deep pool where she would have blackened her pink stockings with golden clocks up her garter, yet she was great, I say, and imposing in her sprightliness."⁵

The second example is taken from the work of the Danish novelist Karin Michaelis. It concerns Madame Yonna suffering from acute delirium of emotional origin. "They were arriving by thousands in procession across the bedroom, the little dolls at five öres collected at Norresundby; they were swinging on a white ribbon: They were all running up, they arrived at the bed, climbed in it, ran about on the nightdress, on the neck, the chin, the nose of Yonna and one after the other made a sweeping bow and whispered 'I have to greet you on behalf of your husband.' As a result of looking down her nose Yonna's eyes hurt. But the demeanor of these diminutive dolls was so impertinent that she could not refrain from laughing. Finally one of the dolls which was quite naked—the others had the stomach encircled by a yellow band like cigars—assumed such a plaintive and

⁵ La Jeune Madame Yonna.

lamentable tone in saying: 'I have to greet you on behalf of your husband' that all the dolls fled like spectres when the hour chimed."

One does not look for medical observations in a novel but the imagination is nearly related to musing. They take their birth with them in the unconscious and it is interesting to show their reciprocal affinity.

ENDOCRINE IMBALANCE AND MENTAL DEFICIENCY

BY HOWARD W. POTTER, M.D.

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Mental deficiency as a problem of medico-sociological significance is demanding of the most serious consideration. It is a factor to be reckoned with in each field of social malrelation and maladjustment. Socially, the mental defective is an outcast except among his own kind; industrially, he is most often a square peg in a round hole; educationally, he is a perplexing problem, and clogs the machinery of the public school system; politically, he is the tool of anarchy; morally, 50 per cent of the inmates of corrective institutions are his type; and economically, he is a constant liability to the state.

Although advances have been made, and well directed efforts have been successful in training the mental defective to utilize to the best of advantage what facilities he does possess, nevertheless, but little effort has been made with the purpose of determining the actual underlying factors, the presence of which inhibit normal intellectual development.

The amassed data of the psychologist is interesting enough, and valuable in the way of assisting in diagnosis and outlining a specialized training, but it seems to have given little or no indication as to the source or spring of the never ending stream of enfeebled intelligence. The same might be said of heredity studies of mental deficiency—they bring out many interesting facts, and leave us with the conclusion that mental deficiency is inheritable. We speak of hereditary syphilis, but, more than this, we know that the *trepennoma pallidum* is handed down through the medium of the germ plasm.

In an attempt to meet this side of the problem of mental deficiency, the glands of internal secretion and their physiological pathology would seem to deserve consideration. We have established as a fact that structural growth and bodily characteristics are influenced by changes in certain of the ductless glands. The sequellae of extirpation of the gonads in reference to accumulation of subcutaneous fat and distribution and growth of hair have been observed not infrequently. The increased growth of the bones in diseases of the pituitary body is another well recognized fact. Experimentally, it has been ascertained that the thyroid has a definite

control over the metamorphosis of the tadpole—a phase of development which might be said to parallel the metamorphosis of the childhood stage to that of adult man or woman. Going a bit farther, and forming a connecting link between the psyche and anatomico-physiological characteristics, I have always found in the inverted individual, whether the homosexuality be latent or patent, many attributes of the opposite sex anatomically as well as psychologically. If, therefore, developmental changes, structural growth, anatomical characteristics, and psychic attributes are all definitely influenced by endocrinopathic conditions, it is within reason to consider the possibility that intellectual growth may also be affected by an imbalance of the endocrine glands.

As early as 1866 or thereabouts Seguin, in his original publication entitled, "Idiocy; Treatment by Physiological Methods," in discussing the morbid anatomy of the brain, states that the "pineal and pituitary bodies were much atrophied," and adds "These anomalies and many more are recorded from the autopsies of microcephalic idiots, but as usual without a word as to their corresponding psychophysiological disabilities." This last is significant of the fact that he at least had under consideration the possibility of some connection between mental deficiency and pathological changes in the pineal and pituitary bodies.

It is hardly necessary to call attention to the association of hypothyroidism with idiocy. Cretinism and its relation to athyrosis was recognized as early as 1616 by Paracelsus. Seguin gives a fairly comprehensive clinical picture of the cretin idiot and adds "Its action (cretinism) does not cease after having produced idiocy, for if its victim be put in a locality where cretinism will aggravate, idiocy will do the same; if placed in circumstances of climate, of hygiene, of exercise, where cretinism may improve, idiocy will also improve, and shall become more amenable to the physiological treatment."

There have been several reports in the past five years, which go a step further in more firmly establishing the interrelation of endocrine imbalance and feeble-mindedness. One of the most significant of these is a report of 100 autopsies on feeble-minded cases by Oscar J. Raeder, in which he found some definite pathological change in the ductless glands in 74 cases. Such a high percentage of pathological change can hardly, and with safety, be called coincidental. Timme has demonstrated by X-ray that 85 or 90 per cent of the Mongolian types of idiocy have a definite, tangible, pathological con-

formation of the sella turcica, in addition to certain constant clinical features pointing to a polyglandular pathology.

This paper, which is presented as merely a preliminary report, is based on a survey of the disorders of the endocrine system as obtained by the examination of a sufficiently large series of feeble-minded patients at Letchworth Village, an institution for the care and training of all types of mental deficiency.

Unfortunately, owing to the fact that the laboratory facilities were still in a developmental stage at the institution, an examination into the blood cytology, blood chemistry, metabolism and roentgenological findings was not available for such a large number. However, inasmuch as the laboratory findings are not definitely proscribed as yet, and as the series is fairly comprehensive, it would seem not unjustifiable to draw conclusions from clinical findings alone, although it is to be regretted, for the sake of gathering much needed data, that the laboratory findings could not be had.

From observations made heretofore in cases with certain changes in the various tissues and systems coincident with destructive tumors and hyper- and hypoplastic states of the various glands, notably the thyroid, pituitary, pineal, adrenals, and thymus, it has been possible, in an empirical way, to attribute such tissue alterations to the under- or overfunctioning of one or more of the glands. Consequently, it has been possible to establish certain diagnostic criteria for the functioning of the above mentioned glands of internal secretion. In defense of this seemingly empirical method, it may be said that there has been a striking consistency in the frequent occurrence of definite symptom complexes and furthermore, conclusions based on such criteria have withstood the therapeutic test in not a few instances.

Criteria for such diagnoses are found in practically all the tissues of the body and even in the make-up of the psyche. To enumerate, certain types of emotional states and mental attitudes are encountered, together with distinctive characteristics of the skeletal conformation; various types of integumental and adipose tissue; amount and distribution of hair; quality, position and type of teeth; development and reaction of muscles; cardiovascular tone; and development and anomalies of the gonads and gonadal functions.

To avoid confusion and indefiniteness, Table I represents a summary of the most marked characteristics or symptoms thought to be associated with certain glandular dysfunctions. Having the limitations of any other summarized set of symptoms, attention should be called to the fact that this chart would fall quite short of the function as an infallible diagnostic table. It is presented merely

as an aid to the reader in forming a rough picture of the main characteristics of each group as discussed. It cannot be too greatly emphasized that the most essential requisite to determining the type of endocrinopathy present, lies in the correct interpretation of the findings so as not to confuse signs of secondary compensatory activity with characteristics of initial defect. Compensation is a saving process of nature and is just as active in the endocrine system as elsewhere, the cardiovascular system for instance.

In all 849 cases were examined. Of this number, 419 were males and 430 were females. This series comprised cases of varying graduations of intelligence, from that of the profound idiot to that of the high grade moron. In actual age, they ranged from five to over fifty years, with those of the second decade in predominance.

Of the total examined, 315 or 37 per cent showed certain signs and characteristics which may be considered as pointing to an endocrine imbalance. This number was equally divided between the sexes. It might be stated that each one of these cases showed not one or two characteristics of an endocrinopathy, but a definite symptom complex.

In reference to the actual age, there were two definite age periods in which the greater number of the cases were found; the first between the ages of twelve and sixteen, and the second over the age of twenty. The first period is contributed to largely by the status lymphaticus group, while the second period contains mainly the groups characterized by disorder of the pituitary body and thyroid gland.

A curve representing the distribution of the level intelligence in terms of years shows a gradual rise and fall and is represented at its apex by the mental age of six, or the level of a high grade imbecile.

In reviewing the results of the examinations, it is found that the cases can be divided into eleven different groups. These groups are established by the constancy of occurrence of certain symptom complexes. Some of the groups were nothing more than a combination of the symptoms of two or more of the other groups, but as such combinations were relatively frequent and uniform it was thought wise to consider them as separate clinical entities.

GROUP I.

This group comprised those cases presenting characteristics shown in Table I in the column under the appropriate heading. Such a syndrome is said to be associated with an enlargement of the thymus, or with a subinvolution of the gland when the syndrome is present in older subjects. This contention has been supported by

demonstrating such a condition by X-ray. In as much as such an association has been established in a large number of cases, it might be proper to call attention to the fact that the absence of positive X-ray findings in such cases should not be considered to militate against the obvious conclusion as on account of the comparative lack of density of the thymus in contradistinction to the extreme density of the neighboring mediastinal tissues, a thymic shadow is rather difficult to obtain.

This group comprised 69 cases or 22 per cent of the total number with positive findings. Of this number 57 were males and 12 were females. There is evidently a difference in some of the details of the economics of the endocrine system of the two sexes; this is evident by the preponderance of the males in this group and by the opposite condition of the distribution by sex in some of the other groups.

The actual age of the cases ran from 4 per cent at seven to 5.9 per cent over twenty years of age, with the greatest number occurring between the ages of nine and sixteen, making the average thirteen years. As to intelligence, the average mental age was seven and ten-twelfths years, with an average I. Q. of 60 per cent.

GROUP II.

The cases in this group were those presenting characteristics associated with an underactivity of the thyroid. These characteristics are briefly enumerated in Table I in the second column. This group included three typical cretins, the remainder being made up of cases resembling the so-called myxedematous type, although it was evident in many, from the skeletal conformation, that the deficient thyroidism was present from an early age and during the period of growth and accretion than acquired in later years.

This group included 46 cases, or 14.6 per cent of the whole number that were endocrinopathic. In this group the females predominated, they being about twice as numerous as the males.

The average chronological age for the group was fifteen years, the mental age six and three-twelfths years, and the I. Q. 43 per cent.

GROUP III.

Characteristics of the cases in this group are shown in Table I, column 3. Such a syndrome, excluding the skeletal characteristics, has been described in destructive tumors of the pituitary body; it has been further demonstrated by radiography that cases with such a syndrome in the absence of a neoplastic formation, have a definitely

small sella turcica. These facts would seem to warrant the association of such a syndrome with a reduced pituitary function.

This group was a relatively small one comprising only 8 cases or $2\frac{1}{2}$ per cent of the total; of this number, 5 were females and 3 were males. The chronological age, mental age and I. Q. showed an average of eighteen years, six and six-twelfths years, and 41 per cent respectively.

GROUP IV.

This group was relatively larger than the former, although it represents the opposite condition of secretion of the gland involved. The characteristics are shown in column 4 of Table I. Like the former group, the association of such a set of symptoms with an overfunctioning of the pituitary body, would seem to be substantiated by the fact that similar symptoms have been observed in hyperplastic tumors of the pituitary and in cases showing by radiograph a definite enlargement of the sella turcica.

Here were found 29 cases, or 9.3 per cent of the 314. Of this number 20 were females and 9 were males. The averages of the actual age, mental age, and intelligence quotient were twenty-one years, seven and six-twelfths years and 47 per cent respectively.

GROUP V.

It is not apart from substantiated physiological data that the overactivity of an organ, unless accompanied by a definite increase in size or hyperplasia of its vital elements, tends to lend to its exhaustion and therewith reduction of its physiological function. Just such a state would seem to be indicated in the pituitary body by the characteristic displayed by the cases in this group as shown on Table I, column 5. For want of a better one, the term "dyspituitary" has been applied to such types of cases.

This group comprised 27 cases or 8.6 per cent of the total showing endocrine disorders. As to sex, the females predominated by far, there being only 3 males among the 27. This group had an average chronological age of nineteen years, mental age of six and eight-twelfths years and intelligence quotient of 42 per cent.

GROUP VI.

This group comprised those cases with a well established and long recognized clinical entity—the so-called Mongolian type of idiocy. The characteristics are briefly enumerated on Table I, column 6. There seems to be ample justification for associating this condition

with a polyglandular imbalance, for there are definite indications of both a hypothyroidism and a hypopituitarism, together with a suggestion of status lymphaticus and a possible deficient suprarenal activity.

Nineteen cases or 6 per cent were in this group, and the number of each sex was about equal. As would be expected the mental age and the intelligence quotient were comparatively low, being four and two-twelfths years and 32 per cent respectively, while the average of the actual age was thirteen years.

GROUP VII.

This group was a relatively small one, consisting entirely of females, who were 8 in number. There seems to be no doubt but what their symptoms were accounted for by a moderate hyperthyroidism. It is interesting to note that in relation to the age of occurrence, there were two rises in a curve representing their ages. The first, between the ages of eleven, twelve, and thirteen, or at the initiation of gonadal activity, which may probably be considered as merely an exaggeration of the normal attending physiological speeding up of thyroid production. The latter rise made up by the cases over twenty, however, probably represents a more definite imbalance than the former.

The average chronological age, mental age and intelligence quotient was sixteen and one half years, six and five twelfths years and 40 per cent respectively.

GROUP VIII.

It seems best to define this group rather more in detail than is indicated in column 8, Table I. Certain characteristics which these patients displayed, in addition to those associated with an over-functioning of the pituitary body, seemed to resemble those observed in destructive lesions of the suprarenal body, notably, the type of hair distribution resembling that of the opposite sex, a certain suggestion of an inversion of the psyche together with low blood pressure and poor vascular tone, and a tendency to bronzing of the skin. The symptoms relating to sex characteristics are probably in association with the adrenal cortex, whose embryological source is the same as that of the gonads, while the vascular signs are associated with an underactivity of the adrenal medulla or chromaffin system.

There were only 11 cases in this group, or $3\frac{1}{2}$ per cent of the total series. Of these, 5 were females and 6 were males. The distribution by chronological age, mental age and intelligence quotient,

showed an average of fifteen years, six and eight-twelfths years and 44 per cent respectively.

GROUP IX.

In a small number of cases, 12, or 38 per cent, there was found a consistent appearance of certain characteristics, which seem to be a combination of those described under Groups I and II. In other words, there were coexisting in the same patient characteristics which were typical of both a status lymphaticus and a poverty of thyroid secretion. In this group, consisting of 1 female and 11 males, the averages of chronological age, mental age and intelligence quotient were eleven years, five and four-twelfths years and 54 per cent respectively.

GROUP X.

Compensation, as was stated previously, is a law of nature. In this series of cases there were found at least two well marked instances of this and the symptoms occurred with such frequency and regularity that it was thought best to group them accordingly. This group and the next one are, therefore, made. In this group were placed those cases of status lymphaticus who, in addition showed signs of an increased pituitary activity. (See Table I, column 10.)

The group was a relatively large one comprising 16.5 per cent or 52 of the cases—33 males and 19 females. The average chronological age was fourteen years, mental age six and eight-twelfths years and intelligence quotient 47 per cent.

GROUP XI.

This group, also representing a compensatory phenomenon, is made up of cases with characteristics associated with both hypothyroid and hyperpituitary states coexisting in the same patient. (See Chart I, column 11.) There were 33 such cases, or 10.5 per cent of the 314; of which number 24 were females and 9 were males.

An average of sixteen years, six and six-twelfths years and 41 per cent respectively of the chronological age, mental age and intelligence quotient was attained by this group.

SUMMARY.

1. The association of endocrinopathies and mental defect is not new. Seguin referred to the pineal and pituitary in his original treatise on idiocy. Mental defect as a part of athyrosis has long been recognized.

2. It has been established that bony growth, hair distribution,

TABLE I.

	GROUP I	GROUP II	GROUP III	GROUP IV	GROUP V	GROUP VI	GROUP VII	GROUP VIII	GROUP IX	GROUP X	GROUP XI
Personality	No initiative Childish reactions Self-centered Poor resistance Fatigability Youthful in appearance	Sluggish Dull Lethargic Irritable	Sluggish Irritable Sullen Obstinate	Boisterous Aggressive Pugnacious	Dull Emotional instability Tantrums Antisocial tendencies	Restless Active Happy Poor resistance	Tense Nervous High-strung	Fatigability Lethargy			
66											
Skeletal	Tall Long trunk Maxillary torus Narrow jaw	Obese Broad hands with short fingers	Adiposity Small bony frame Narrow jaw Tapering fingers Narrow eye distance	Typical acromegalic facies with less marked types Square jaw	Same as group III	Small boned Saddle nosed Short, broad hands and feet Mongolian type of eyes	0	0			
Muscular	Lax ligaments	Myotic irritability	0	0	0	0	Tremors	0			
Skin	Smooth Velvety Infantile Moist Rosy complexion	Dry Poor reaction Thickened	0	0	0	Dry, red & thickened over hands & feet Mottled over arms thighs & trunk	Flushes easily Moist Rapid & marked reaction	Pale Sallow complexion White line reaction			

Hair and nails	Generally deficient Lanugo on face	Dry and brittle Falls out Sparse eyebrows Slow growing, thick, brittle, ridged nails	Tendency to deficiency Distribution of the opposite sex	Increase of hairy growth Nasal brow	Same as group IV	Generally deficient	0 Nails fast growing	Increased hairy growth Nasal brow	ION OF GROUP I AND GROUP II	ION OF GROUP I AND GROUP IV	ION OF GROUP II AND GROUP IV
Teeth	Large, long central incisors with narrow, small lateral incisors Tendency to be crowded	Poor in calcium Chalky and soft	Crowded Irregularly erupted & placed	Large, broad, hard, spaced	Same as group III	Small, peg shaped, poor in calcium	0	Spaced	ION OF GROUP I AND GROUP II	ION OF GROUP I AND GROUP IV	ION OF GROUP II AND GROUP IV
Gonads	Small Inversive characteristics	Reversive characteristics Later puberty	Reversive characteristics Later puberty	Somewhat early puberty	Increased libido Menstrual irregularity Reversive tendencies	Reversive & inverse characteristics	Menorrhagia	0	ION OF GROUP I AND GROUP II	ION OF GROUP I AND GROUP IV	ION OF GROUP II AND GROUP IV
Cardiovascular	Low blood pressure Poor vascular tone Prone to syncope	Slow pulse	Low blood pressure	Increased blood pressure	Increased blood pressure	Low blood pressure Poor vascular tone	Usually increased blood pressure	Low blood pressure	ION OF GROUP I AND GROUP II	ION OF GROUP I AND GROUP IV	ION OF GROUP II AND GROUP IV
Miscellaneous	Bed wetting	Also includes typical cretin	Enuresis			Tongue furrowed Increase mucus secretions	Enlargement of thyroid		ION OF GROUP I AND GROUP II	ION OF GROUP I AND GROUP IV	ION OF GROUP II AND GROUP IV

deposition of subcutaneous fat, sexual development, psychological attributes and metamorphosis may be influenced by one or more of the glands of internal secretion. In as much as this is true, the bearing which the ductless glands have upon the amount of intellectual endowment should deserve careful investigation.

3. With this purpose in view, 849 cases at Letchworth Village were examined from an endocrinological standpoint. Of this number, 314, or 37 per cent showed evidence of some type of endocrinopathy. The average chronological age of this 37 per cent was fifteen years, the intellectual age, six and five-twelfths years, and the percentage of normal intelligence was 43.

4. It was possible to classify these cases according to the characteristics shown, and divide them into 11 different groups. Each of these groups showed a uniform appearance of a certain combination of findings which have previously been observed in conjunction with known disorders of the endocrine glands, and hence they were termed accordingly. These groups were as shown on Table II.

TABLE II.

CHARACTERISTICS OF WHICH GROUP ARE ASSOCIATED WITH—		NO. OF CASES	PER CENT OF CASES	AVERAGE C. AGE	AVERAGE M. AGE	AVERAGE I. Q.
I	Status Thymico-Lymphaticus	69	.22	13 yrs.	7 10-12 yrs.	60%
II	Hypothyroidism	46	.146	15 yrs.	6 3-12 yrs.	43%
III	Hypopituitarism	8	.026	18 yrs.	6 6-12 yrs.	41%
IV	Hyperpituitarism	29	.093	21 yrs.	7 6-12 yrs.	47%
V	Dyspituitarism	27	.086	19 yrs.	6 8-12 yrs.	42%
VI	Mongolism or Polyglandular Type	19	.06	13 yrs.	4 2-12 yrs.	32%
VII	Hyperthyroidism	8	.026	16½ yrs.	6 5-12 yrs.	40%
VIII	Hypoadrenalism with Hyperpituitarism	11	.035	15 yrs.	6 8-12 yrs.	44%
IX	Status Thymico-Lymphaticus with Hypothyroidism	12	.038	11 yrs.	5 4-12 yrs.	54%
X	Status Thymico-Lymphaticus with Hyperpituitarism	52	.165	14 yrs.	6 8-12 yrs.	47%
XI	Hypothyroidism with Hyperpituitarism	33	.105	16 yrs.	6 6-12 yrs.	41%

5. The cases showed evidence of a pathological physiology chiefly of three glands; namely, in order of occurrence, the pituitary, the thymus, and the thyroid.

One hundred and sixty cases showed evidence of a disturbed pituitary function. In two-fifths of these the dysfunction was primary. In the remaining three fifths there was a hyperactivity of the pituitary, probably as a compensatory reaction to an initial defect in one or more of the other glands of internal secretion.

One hundred and thirty-three cases were of the status lymphaticus type. A half of these showed no evidence of a defect elsewhere in the endocrine system, two fifths showed signs of a pituitary overactivity and one tenth were accompanied by a condition of hypothyroidism.

Ninety-nine cases had characteristics of a thyroid dysfunction. All but one twelfth of these seemed to have a condition indicating an underactivity of the thyroid, half of which were accompanied by a status lymphaticus or had symptoms pointing to a compensatory pituitary overactivity.

In only 11 cases did there seem to be a suprarenal complex present. In all of these the fault seemed to be in a reduction of function, involving the cortex as well as the medulla. It is interesting to note that there was evidence of pituitary overactivity, probably in the nature of a compensation, in each of these cases.

CONCLUSIONS.

In as much as this is merely a preliminary report, definite conclusions are not warranted. One does get the impression however, that there is here a significant problem, which needs to be worked out with the aid of clinical, psychological, therapeutic, and laboratory data.

In conclusion, it might be stated that it seems hardly within the bounds of coincidence that there were found so many indications of an endocrine imbalance in 37 per cent of the greater part of the inmate population of an institution for the feebleminded.

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

397TH REGULAR MEETING, JUNE 6, 1922.

DR. E. G. ZABRISKIE, Vice-President, presided.

THE STATESTHETIC AND KINESTHETIC COMPONENTS OF THE AFFERENT SYSTEM

DR. J. RAMSAY HUNT, NEW YORK

[Author's Abstract]

Dr. Ramsay Hunt, as an introduction to the *sensory* aspects of posture and of motion, summarized his views on the duality of function of the *efferent* system.

According to his conception, the whole efferent nervous system, both cerebrosplinal and vegetative, consists of two components, which are physiologically and anatomically distinct. One he terms the *static* system which regulates posture; the other is the *kinetic* system controlling movement itself. In muscle, the kinetic system innervates the anisotropic contractile mechanism and the static system the isotropic sarcoplasm. The function of the sarcostyles is movement. The function of sarcoplasm is postural fixation, posture following movement like a shadow.

The efferent system, phylogenetically considered, consists of three great physiological divisions, which he terms *archeokinetic*, *paleokinetic*, and *neokinetic*. The segmental nervous system contains the archeokinetic and archeostatic components of motility, representing reflex movement and reflex posture (*archeokinesis*).

The paleokinetic and neokinetic mechanisms for the regulation of higher types of movement are found in the suprasegmental nervous system. The paleokinetic mechanism consists of the corpus striatum, its subordinate spinal systems (extrapyramidal tracts), and cortical connections through the optic thalamus (cortico-paleokinetic system). This system controls movements of the automatic-associated type. (*Paleokinesis*.) The neokinetic mechanism consists of the Rolandic area and its corticospinal system (pyramidal tracts). The neokinetic system is concerned with isolated-synergic types of movement (*neokinesis*).

He regards the cerebellum as the essential suprasegmental structure for the regulation of postural function. Both *neostatic* (isolated-synergic) and *paleostatic* (automatic-associated) types of posture are represented. The neostatic function is related to the

hemispheric system and the paleostatic to the vermician system of the cerebellum.

In peripheral nerves and voluntary muscle the *myokinetic system* is represented by medullated nerves, and the sarcostyles of the muscle fiber. The *myostatic system* by nonmedullated nerve fibers, and sarcoplasm. Each system has its special form of tonus, a contractile tonus, referable to the kinetic mechanism (*kinetotonus*) and a plastic tonus referable to the static system (*statotonus*).

The *Static and Kinetic Components* of the *Vegetative Nervous System* for the control of unstriated muscle are represented in the *sympathetic* and *parasympathetic* systems respectively. These two systems control the postural function and primitive motility of the blood vessels, glands and viscera. Both systems differ essentially in their physiological manifestations and pharmacological reactions. Anatomically, the parasympathetic system (midbrain, bulbar and sacral autonomic outflow) consists of medullated nerve fibers, while the sympathetic proper is composed of nonmedullated nerves. Unstriated muscle, like striated muscle, is composed of fibrillae and sarcoplasm. The fibrillae pass from one cell to another, forming a contractile network, and subserve the function of primitive movement. The sarcoplasm is concerned with primitive posture which permits the adaptation of blood vessels and hollow organs to their contents (capacity-posture).

According to the conception advanced by Dr. Hunt, both the cerebrospinal and vegetative nervous systems, as well as striped and unstriated muscle, present evidences of static and kinetic systems underlying the functions of motility.

In the phylogenesis of movement the contractile cell passes by gradual stages from cells of the nonstriated to the striated type, heart muscle representing a transition form, between the two. Posture is the dominant function of involuntary muscle which coincides with the predominance of sarcoplasm. In voluntary muscles, movement is the dominant function and there is a corresponding differentiation of the contractile mechanism.

In both voluntary and involuntary muscles various types of muscle fiber may be recognized, representing transitions from lower to higher forms. These differences in muscle structure are in harmony with the phylogenesis of the efferent nervous system—archeokinetic, paleokinetic and neokinetic. For the "effector" end organs which express the contractile function must also undergo changes in evolution, in order to fulfill the demands of a more highly organized central nervous system.

These two systems also have important relations to symptomatology. Symptoms referable to both the kinetic and static systems may be released by the dissociations of disease. A lesion of the kinetic system caused a disorder of movement and of the static system a disorder of tonus or of posture. This principle holds for both the splanchnic and somatic systems.

The kinetic mechanisms of the *somatic* system may give rise to various types of convulsive manifestations, viz., *kinetic types* of

epileptic seizures (tetanic and clonic); also chorea, athetosis, dystonia, the tremor of paralysis agitans; paramyoclonus, myokymia and fibrillary twitchings.

Related to the static mechanism are sudden postural relaxations of epilepsy, partial or general (*static seizures*). All forms of myotonia: cerebral, cerebellar, spinal and peripheral. Also cerebellar symptoms, viz., asynergia, dysmetria, adiadokokinesis and intention tremor.

Even in the *psychic sphere* evidences of a dual representation are manifest in the hyperkineses of psychic origin (convulsions, chorea, tic convulsive) and in certain postural disorders (catatonia, catalepsy). A similar interpretation may also be given to *active* and *passive* perseveration.

In the *vegetative nervous system*, disorders of movement are related to the kinetic system (parasympathetic). This may be expressed by hyperkinesis, e.g., gastric and intestinal hypermotility.

Related to the static system or sympathetic are disorders of postural tone. Conditions of atony and dilatation of the blood vessels and the hollow viscera. This conception implies, therefore, a parallelism of structure and function of the kinetic and static systems throughout the whole efferent mechanism, from its lowest to its highest levels. A duality of function which is revealed in many different fields of investigations, and which is manifested in the symptomatology of the nervous system.

Dr. Hunt then passed to a consideration of the sensory aspects.

KINESTHETIC AND STATESTHETIC SYSTEMS

The sense of movement and the sense of posture are well recognized components of deep sensibility. Both of these forms of Bathyesthesia are composed of sensory impressions, derived from various sources, chiefly from the muscles, but also from the joints, tendons and fascia. The vestibular mechanism, as was pointed out by Sherrington, is also closely related to the proprioceptive system and plays an important rôle in the regulation of postural tone. And it is interesting to note that recent investigators (Magnus and Kleijn, Randall, Hunter) recognize the existence of a *kinetic* as well as a *static labyrinth*, in which the semicircular canals yield kinetic impulses and the otoliths, static impressions. And it is not unlikely that the labyrinth has a statesthetic and a kinesthetic function quite separate and distinct from one another, subserving respectively the sensory aspects of posture and of motion.

In the conception of a statesthetic and kinesthetic function which is here presented, Dr. Hunt has reference more particularly to muscle sensibility (*myesthesia*) and its relation to the dual functions of motility. For if it be true that the efferent nervous system from its earliest development in the vegetative mechanism to its highest expression in the cerebral cortex, shows evidence of a static and a kinetic mechanism, the existence of a similar division of function in the afferent sphere is a necessary corollary. For the efferent system is only one limb of the reflex arc and where two separate

physiological systems exist subserving the function of motility, so different in the nature of their contractile function, there must also be corresponding differences in the function and morphology of their afferent mechanisms.

One may postulate, therefore, in both skeletal and visceral muscle the existence of special afferent systems for the transmission of sensations of movement and of posture to the central nervous mechanism. One is the kinesthetic component of muscle sensibility conveying impulses of movement (*kinesthesia*); the other is the statesthetic component conveying impulses underlying postural tone (*statesthesia*).

Anatomical Considerations: As has already been mentioned, the striated muscle fiber has two types of motor nerve endings, which are probably related to the kinetic and static systems of motility. One is the motor end plate which is the terminal of a medullated nerve fiber (myokinetic effector); the other is a sympathetic type of the nerve ending, the terminal of a nonmedullated nerve fiber (myostatic effector). Both of these terminals are beneath the sarcolemma (hypolemmal) and therefore in direct relation with the contractile content of the muscle fiber.

In addition to these motor types of nerve endings, the investigations of Huber, Crevetin and Dogiel have shown the existence of other terminals of a sensory character in relation to the muscle fiber. These are the nerve endings of both medullated and nonmedullated nerves, and are situated outside the sarcolemma.

They are found on the outer surface of the muscle fiber, the tendon and musculo-tendinous junction as well as in the intermuscular connective tissue and are evidently sensory in their function.

Dogiel, who used the methylen blue method and whose investigations were carried out on the ocular muscles (recti) of man and mammals reached the conclusion that there are two kinds of sensory nerve endings for each muscle fiber. These are the terminals of both medullated and nonmedullated types of nerve fibers. In one form the nerve ending entwines the muscle fiber, very frequently throughout its whole length. The other surrounds the end of the muscle fiber in the form of a palisade, the fiber fitting snugly into this end apparatus. Between these two typical types of sensory nerve endings of muscle fibers there are various transition forms. It is very evident from these investigations that muscle fibers are well supplied with sensory nerves, and nerve endings of both medullated and nonmedullated types.

It would be premature to attempt any correlation between these histological studies and a possible kinesthetic and statesthetic function. As, however, in the effector sphere there is already considerable evidence showing that kinetic function is controlled by a medullated nerve fiber and static function by a nonmedullated nerve fiber, it is possible that a similar morphological difference and correlation may hold for the effectors and the afferent system. For the greatest evolution and highest differentiation of motility is in the kinetic sphere, and it is therefore possible that posture function,

which is automatic and secondary, is subserved in both the afferent and efferent sphere by nerve fibers of primitive nonmedullated character.

The Statesthetic and Kinesthetic components of muscle sensibility unite with fibers from other structures subserving the sense of movement and of posture and pass together in the spinal cord, the brain stem and the thalamo-cortical pathway. In conditions of disease because of their proximity, both of these components of the proprioceptive system are usually involved together. That is, disorders of the sense of posture are usually associated with loss of the sense of movement.

Within the spinal cord, the kinesthetic and statesthetic systems pass together in the columns of Goll and Burdach to the nuclei of the posterior columns. From these nuclei, secondary pathways pass in the corpora restiforme to the cerebellum, in the interest of postural function while other fibers, both kinesthetic and statesthetic, are continued in the brain stem to their secondary terminations in the optic thalamus. The ventral and dorsal direct cerebellar tracts pass directly to the vermis cerebelli from their primary stations in the gray matter of the spinal cord.

From the optic thalamus kinesthetic and statesthetic impulses are conveyed by its commissural system to the corpus striatum for the regulation of automatic-associated movement (paleokinesis). From the optic thalamus, the kinesthetic and statesthetic systems are then continued in their tertiary and final pathway to the parietal lobe of the cerebral cortex.

In addition, therefore, to those sensory structures which participate in the reflex postural and kinetic functions of the segmental nervous system, three great stations representing posture-motion groupings may be recognized, viz., in the myelencephalon (nuclei of Goll and Burdach), the diencephalon (optic thalamus) and the neo-encephalon (parietal lobe).

Dr. Hunt believes that these two sensory systems play an important rôle in the *reflex* production of the phenomena of reciprocal innervation, which is so striking a feature of muscular activity, viz., concomitant relaxation of the static or posture mechanism of antagonistic muscles with contraction of the agonists.

RELATION OF THE STATESTHETIC AND KINESTHETIC SYSTEM TO SYMPTOMATOLOGY

A disorder of the kinesthetic system would produce a loss of the sense of movement, viz., *kinetic ataxia*. A disorder of the statesthetic system would produce a loss of postural sensibility, viz., a *static ataxia*.

The statesthetic system is the sensory component underlying plastic tonus (*statotonus*), the "lengthening and shortening reactions of muscles and other manifestations of postural tone, e.g., reflexes of posture. The kinesthetic system is the sensory component underlying the "twitch," the contractile tonus (*kinetotonus*) and reflexes of movement.

These two functions of the proprioceptive system are usually involved together and frequently in the same degree. In some cases, *e.g.*, in tabes, a more selective involvement may occur, causing kinetic ataxia, loss of tendon reflexes, with little or no loss of postural tone; on the other hand, there may be a well marked hypotonia without ataxia or loss of tendon reflexes.

Involvement of the corpus restiforme by cutting off statesthetic or postural stimuli to the cerebellum will produce a *static* ataxia.

This is a pure ataxia disorder due to loss of the postural synergy of the cerebellum and is not associated with other disturbances of deep sensibility. *Kinetic* ataxia, on the other hand, is an incoördination of movement dependent upon a loss of the afferent systems conveying kinesthetic impulses to the efferent mechanism.

ON THE OCCURRENCE OF STATIC SEIZURES IN EPILEPSY

DR. J. RAMSAY HUNT, NEW YORK.

[Author's Abstract]

Under the heading "*static seizures*" Dr. Ramsay Hunt directed attention to the occurrence of a form of epileptic seizure characterized by *sudden losses of postural control*. This type of epileptic manifestation he believes is related to the static system of motility, and would differentiate it from the convulsive or kinetic type of seizure which gives the characteristic imprint to the clinical picture of epilepsy. In the course of investigations at the Craig Colony for Epileptics he observed a number of patients in whom static seizures were present. The *kinetic type* of seizure is the common one and may result from a variety of causes, toxic, organic and emotional. The *static type* of seizure, up to the present time, he has observed only in cases of idiopathic epilepsy.

Static seizures are characterized by a sudden loss of postural control, just as the kinetic seizure is characterized by a sudden release of motion mechanisms.

The static seizure may occur alone, as a dissociated manifestation of epilepsy. The loss of postural control is sudden and shocklike, the patient falling to the ground with abrupt violence in response to the law of gravity. This sudden plunge or drop is characteristic of this type of seizure and is not infrequently the cause of serious injury, especially to the face and head. It is quite different in its character from the usual fall of the epileptic in the convulsive attacks. In one case, both patellae had been severely injured by frequent and severe *drop-seizures*. While the drop is sudden the postural relaxation is only of short duration, the patient rising almost immediately from the ground without assistance. The fall is usually associated with transitory loss of consciousness, which may, however, be very slight. In not a few instances there is scarcely any appreciable obscuration of consciousness. The fall is usually forward and is associated with a sudden relaxation or "giv-

ing way" of the lower extremities. As a rule there are no convulsive manifestations, although the two varieties of attacks may be combined. In the type of seizure just described the postural relaxation is more or less general in character, the patient falling in a heap from complete loss of postural control.

Contrasted with these more or less general types of postural relaxation, with obscuration of consciousness, these patients often show a more limited or local form of postural relaxation, which may be quite circumscribed in character and distribution, and associated with myoclonic jerks or starts. Such myoclonic manifestations are not uncommon in the early morning hours in cases of epilepsy and particularly on arising, and are often relieved or lessened by the recumbent posture. They are characterized by sudden muscular jerks or starts, often bilateral, which may affect the arms, trunk, head or legs. Usually there is only a single muscular contraction, although these may follow one another in rapid succession. Patients during the period of myoclonia are very liable to drop objects held in the hand and typical general static seizures in this group of cases, from a more general postural relaxation, are not uncommon.

While in the present state of our knowledge one cannot assert positively that these myoclonic manifestations are exclusively related to the static system, it is his belief that a very close relationship exists, and that the myoclonic jerk or start is often only a secondary or compensatory kinetic manifestation in response to sudden localized relaxation in the posture sphere. From experimental evidence, some posture relaxation precedes, or accompanies, nearly every form of cortical movement, so it is possible that both of these elements may play a rôle in these minor motor manifestations of epilepsy. The typical drop-seizures are by no means common, and up to the present time, his experience is limited to ten cases. When these attacks are present they tend to recur with a certain degree of regularity and persistence.

A few months ago, at a meeting of this society, under the title *Dyssynergia cerebellaris myoclonica*, Dr. Hunt reported a group of cases, with symptoms of cerebellar disease, associated with myoclonus epilepsy. In several of these patients typical static or drop-seizures were observed and the question of the relation of myoclonus to the static system was considered. In one case examination of the central nervous system showed a primary atrophy of the cells of the dentate nucleus and its efferent system in the superior cerebellar peduncles. This lesion causes a break in the static or posture system and may have some relation to the myoclonia.

In a previous study Dr. Hunt outlined in a preliminary manner the course and distribution of the static or posture system of motility. The *neostatic system*, he believes, arises in close relation to the neokinetic area of the Rolandic region. It then descends in the anterior limb of the internal capsule, the mesial portion of the crus cerebri to the pons, where it terminates in relation to the ventral nuclei of the pons varolii. This corresponds to the frontopontine tract of neuro-anatomy. From the pons the fibers cross to the opposite

cerebellar hemisphere and then descend by way of the dentate rubro-spinal and other systems to the sarcoplasm of muscle, the function of which is fixation of the muscle fiber in terms of posture. The static seizure, he believes, is related to a disorder of this mechanism. Dr. Hunt also considered the experimental evidence showing the importance of this system in the regulation of posture and the static function of muscles.

Hering and Sherrington in 1898, in their study of reciprocal innervation showed very clearly that postural inhibition and muscular contraction could be elicited by electrical excitation of the cerebral cortex, and that there exists a coördinate innervation in which the relaxation of one group of muscles occurs as an accompaniment of the active contraction of another set. They mention the experimental studies of Bubnuf and Heidenhain on the excitation and inhibition of the motor centers of the cortex and similar studies of Exner on the cortex of the rabbit.

The experiments of Sherrington were carried out on cats and monkeys. He was able to show that stimulation of the appropriate center, *e.g.*, that presiding over extension of the elbow, produced an immediate relaxation of the biceps, together with active contraction of the triceps. If the biceps or relaxing muscle is palpated during this experiment it becomes suddenly soft as if it were melting away under the examiner's touch, while the forearm is extended by contraction of the triceps. As soon as the stimulation is discontinued the arm returns to its previous posture of flexion. By weakening the faradic current, relaxation can in many instances be induced without any obvious contraction of the opposed muscles. The relaxation seems to occur quite synchronously with or sometimes a little prior to the contraction of the opposite group. The points of cerebral cortex from which relaxation and contraction of a particular muscle, *e.g.*, biceps brachii, can be evoked respectively are distinct from one another and often even in a small monkey lie more than a centimeter apart. Besides, therefore, a localization for muscles according to their contraction there is also a cortical localization different in scheme and capable of demarcation by observations with relaxations as index.

It is interesting to note that Sherrington also obtained relaxation of certain muscles by stimulation of various points on the cross section of the internal capsule.

Sherrington also confirmed these results by cortical stimulation in decerebrate rigidity. After ablation of one cerebral hemisphere a homonymous extensor rigidity develops which presents an opportunity for examination of the sphere of excitation of the cortex upon the extensor muscles of the crossed elbow and knee.

He found in the Rolandic region of the monkeys a cortical area, which gives markedly and forthwith, inhibition of the contraction of the extensors of the elbow and another cortical area which similarly when excited inhibits the contraction of the extensor of the knee.

Weed, in an elaborate study of decerebrate rigidity has still further clarified this subject. Weed found that inhibition of the

extensor spasm of decerebrate rigidity could be obtained from the motor cortex of the Rolandic area, from the mesial anterior portion of the internal capsule, from the mesial one-sixth of the crus cerebri, from the pons and from the anterior portions of the superior vermis.

In a later study Cobb, Bailey and Holtz also investigated the genesis and inhibition of extensor rigidity in cats. They found that electrical stimulation of the cortex of the anterior lobe of the cerebellum produced an inhibition of the rigidity in the ipsilateral muscles. Finally the anterior lobe was removed exposing the dentate rubral tracts, stimulation of which produced an even more marked inhibition of the extensor rigidity.

In conclusion, therefore, on the basis of clinical observation and experimental data, Dr. Hunt would postulate the existence of a type of epileptic manifestation characterized by sudden losses of postural control. He believes that these are referable to a loss of static control and may be regarded as static seizure, in contrast to the convulsive manifestations which are essentially kinetic in origin.

DISCUSSION

DR. L. PIERCE CLARK, New York, said: Since knowing Dr. Hunt's views relative to static seizures in epilepsy, I have been keen to find them, but I believe that I have never seen such attacks in epilepsy. The report of a pure static seizure without a slight preceding tonic spasm I believe is due to faulty clinical observation. We all know, however, the tonic, clonic and simple paralytic phases of an epileptic seizure are subject to wide fluctuations in their proportional relations in a given seizure and in different epileptic individuals. While any particular seizure may be preponderantly static in type, I believe the dictum of Hughlings Jackson, that some degree of muscular spasm invariably occurs in every epileptic attack and that if studied closely the tonic element will be disclosed at the very inception of supposedly pure static seizures.

DR. SMITH ELY JELLIFFE, New York, said: I have been very much interested in Dr. Hunt's paper, and I am sure every member of the Society has been so, too. I remember a conference I had with Dr. Hunt when he gave his presidential address to the American Neurological Association. He gave then the beginning of the thesis which he has now amplified. I was not entirely satisfied with the hypothesis as then presented. I told him that he was neglecting the geotropic stimuli, *i.e.*, the response of the organism to the stimulus of gravity. I see that he has now included that aspect in his hypothesis, and I like it a good deal better than I did four years ago.

I think he is right in the possibility of the static type of loss of function. He can call it epilepsy if he cares to do so. There is a sudden failure of the geotropic mechanism. Whether his analysis of the pathways is valid or not, I cannot say. Dr. Hunt speaks of the function of the otoliths. I think that the inertia stimulus is a very important factor. We have to have some sort of function of inertia. The planet we are on is being whirled in space at an enormous speed and we, and our whole system, are being carried at a

tremendous rate toward Alpha Tauri, or wherever it is we are going, so that inertia becomes an important force. The recent work of Magnus, Winkler, Kleijn and the whole Dutch school has emphasized the function of vestibular mechanisms, as handling inertia and geotropic stimuli. I am glad that Dr. Hunt has included the inertia stimuli in making his whole conception of the motility mechanism more plain. We don't understand all the integrating factors of the synthesis, but we are further along than we were five years ago. We are fortunate in having a member in our Society, who, patiently, persistently and understandingly has attempted to analyze such an important series of mechanisms.

DR. C. L. DANA, New York, said: Dr. Hunt has presented his views lucidly and it is not easy to criticize them without more careful consideration than can be given in a casual discussion. I have somehow a feeling that the phenomena of mental and neural function cannot be altogether explained by a system of more and more complicated and integrated mechanisms. There has to be an explanation of what balances the integrations and how the machines still work when most of the machine is gone, as in people without any labyrinth and very little cerebellum and no cervical sympathetic system to speak of.

In regard to the static epileptic seizures Dr. Dana thought Dr. Hunt was right. He had some years ago reported such a case, which seemed to correspond with the old term of "falling sickness." His patient, a boy, would "crumple up" in the street or at home with instantaneous relaxation of all his muscles. There might have been an unobservable period of muscular tonus first, but he could not see it. The boy simply dropped right down and got up again at once. The case was reported as true "falling sickness." He had seen several other cases of static epilepsy since that time and Dr. Hunt had described the characteristic phenomena correctly.

DR. I. ABRAHAMSON, New York, said: We must be careful in accepting unreservedly a dictum that agonist and antagonist always act in the manner described. In encephalitis we have seen several cases in which the biceps and triceps contract at exactly the same instant. We have had such cases at the hospital. As far as static attacks are concerned, we should first show static seizures in Jacksonian epilepsy. The crumpling up may be an expression of more or less sudden and complete loss of consciousness. Gyrotory, propulsive or retropulsive seizures, falling to either side or forward and backward like a falling tree would be more suggestive of static attacks than a mere crumpling up.

DR. RAMSAY HUNT, New York (closing), said: I agree with Dr. Clark that in some cases of sudden postural relaxation (static seizures) it is difficult to say positively that there is not some perturbation of function in the kinetic sphere. That, however, does not invalidate the essential features of his hypothesis. This type of seizure is of the static type and is, I believe, due to a sudden postural relaxation in the static sphere of the cerebral cortex. It is a refinement of diagnosis and has more of a physiological than practical

interest. It reopens the question of postural relaxation in reciprocal innervation, a question which Sherrington initiated several years ago. I would like to postulate the existence of *static centers* as well as *kinetic centers* in the cerebral cortex; one controlling posture and the other for the regulation of movement, and I believe that these two types of centers are susceptible of demonstration by experimental methods.

THE NATURE OF ESSENTIAL EPILEPSY

DR. L. PIERCE CLARK

NEW YORK

[Author's Abstract]

The epilepsies, when stripped of all their organic and symptomatic types, leave us a large group of epileptics who apparently in spite of any obvious cause still exhibit periodic fits, and to this group is applied the term essential epilepsy. It has been found that every such epileptic individual possesses a primary defect in the instinctive life, called the epileptic constitution. The glaring clinical manifestation of such a personality is its crude form of egotism, possessing a correlate of extreme supersensitiveness and an emotional poverty as a part of the defective developing character. We then postulate that social and life adaptations in such individuals cannot be met without enormous stress and the varied life issues entailing the latter precipitate epileptic reactions. We therefore look upon the fit as a break in the life demand for adaptation, and the nature of the fit as a protective and regressive phenomenon. The more severe and frequent the fit, the deeper the regression. We have thoroughly detailed clinical material to substantiate this thesis, namely, that essential epilepsy is really based upon the defective primary endowment, the epileptic constitution.

DISCUSSION

DR. SMITH ELY JELLIFFE, New York, said: Every time I try to discuss the problem of epilepsy, I am amazed at my own temerity. Still I am modest. Dr. Hunt's paper gave us an inkling of how little we know about the motor mechanism which may be involved in only a very small part of its functional capacity, such as in chorea, athetosis or intention tremor for instance, which is only a small faulty discharge of function. He has shown how complex the mechanisms may be. We must be very modest indeed when we commence to tackle such a broad type of functional discharge as that of the epileptic attack. We are involved in a host of studies, not only from the muscular standpoint, but from that of metabolism as well when we attempt to discuss so wide a problem as the epileptic discharge.

My acquaintance with Dr. Clark's views has been both pleasant and profitable since first I met him at the Craig Colony in 1896. Since that time everything he has said has interested me, but I am

still far from secure in my own mind as to what he means. I see no contradiction between the terms functional and organic. Every function has to work through an organ, so that to separate functional and organic in the deep philosophic sense is impossible. Where does he put the separation of functional types from organic types? He says he has pushed out every case that can be explained such as those caused by bony spiculae, inflammation, tumor, etc., etc., and that leaves a residue of cases that he calls essential epilepsy. In these cases he finds a type of constitution. That constitution he says is based upon defective development. What does he mean by defective development? If he takes up psychogenic epilepsy does he mean that the development is mental? Are psychogenic and mental synonymous terms? He has not made it clear to us what he means by defective development. He has given us a faulty definition of what he calls defective development. It leaves us in the dark as to what might he called psychogenic epilepsy.

If he means by psychogenic the function of handling symbols, then I can understand what he means by an essential epilepsy. The symbol functions at a very high energy potential. When captured by the body it must be transformed and the energy redelivered. Symbolic delivery is the most essential and dynamic in the behavior mechanism. A psychogenic epilepsy, then, is one in which the symbolic functioning is defective.

DR. BERNARD SACHS, New York, said: I am in sympathy with Dr. Clark's attempt to elucidate the general problem of epilepsy. We are all conscious of the difficulty of explaining the disease, either to the patient and his relatives, or to ourselves. Dr. Clark has made use of a number of phrases from his personal experience, which are more or less new to us. I wish it understood that my remarks are made in an entirely friendly spirit to Dr. Clark's work. He spoke of primary defects, of epileptic reactions, of the epileptic make up, of the imperfect adaptation of the patient to his environment, of stress—terms which are all unfamiliar in the general neurological verbiage.

I would like to ask in a frank way, whether in his own mind he has gone beyond the position which I have maintained for many years. If I may refer to my own method of answering the patient or his relatives who inquire, "What does this condition mean? What does it signify?" My answer has been that this special patient has a predisposition to this special form of disease: or I may have said that his brain is subject to peculiar discharges and I have added that anything that goes wrong in the body will be apt to produce these discharges, whether it be imperfect digestion, gastro-intestinal disturbance, or some form of peripheral irritation. We have the disturbance, and it will probably give rise to the peculiar discharges, by reason of the predisposition to such discharges. I want Dr. Clark to say whether there is anything in his conception that goes beyond that statement. If there is, I have not been able to seize upon it.

Inasmuch as we are all interested in all these different questions of seizures, I want to refer to a peculiar experience I had. The

patient was a man traveling around the world and had received all sorts of different interpretations of his symptoms. He would fall down suddenly and frequently. While walking he would suddenly drop. This would happen several times, and then he might not have an attack again for months. In examining this man I was puzzled for some time as to whether these were epileptic seizures or whether it was a case of intermittent claudication. Symptoms of that sort might occur in intermittent claudication. I finally concluded there was epileptic disease although the other symptoms were entirely wanting in that case.

The whole question is very interesting. I do not wish to criticize Dr. Clark's interpretation. I would like to know if he has gone beyond the point I stated, and if so, in what way?

DR. M. OSNATO said: If I remember Dr. Clark's statement about the delirium in petit mal, he said that it was of the functional type because its content dealt with the occurrences in the everyday life experience of the individual. I don't think that is any criterion. All delirial productions deal with ordinary life experiences, with what is in the consciousness. So, that this is so does not prove that the delirium in petit mal is functional and not organic. In the encephalitis cases we have all seen the delirium dealt with daily happenings in the individual's environment and things which were clearly the everyday experience of the patient. I think there is danger in laying too much stress on the makeup and personality as determining mental disease from which the patient suffers. We went through that phase with dementia praecox. The three points which Dr. Clark emphasizes, viz., egocentricity, emotional poverty, hypersensitiveness, are not different in the personality studies of dementia praecox cases. The type of reaction is influenced by makeup surely, but not the disease itself. Dr. Clark said that a tyro can pick out the epileptic makeup, but that the epileptic can have minor degrees of the same attributes and then carefully trained skill is necessary to bring out the points. All normals have a representation of something that makes that same personality though present in varying proportions. Many of us are selfish; some are sensitive, some are hypersensitive; some are not very rich emotionally. If you are looking for things you will find them in nearly everyone. We have had to take back a lot of things about the dementia praecox makeup except possibly as determining types of reactions. There are potentialities in the characters of a great many people of just the same qualities that are supposed to belong to the epileptic makeup. Why should the mechanism be different in epilepsy if it is of psychogenic origin? If the convulsive manifestations are so caused in hysteria why should the convulsion in epilepsy be so different? Why should the psychological mechanism work differently in epilepsy, and express itself in convulsive manifestations which are objectively and by various chemical and other means so readily differentiated from the convulsive manifestations of hysteria?

DR. I. J. SANDS said: I have been closely following the works of Dr. Clark and have benefited materially from them as his descrip-

tion of the personality of the epileptic has stimulated me to study epilepsy from another angle. However, there are many points which Dr. Clark has mentioned which do not fit my experience in studying epilepsy. In the first place, I take issue with him when he says that there is a primary defect in the instinctive life of the epileptic. When one thinks of the instinctive life of an individual as ordinarily described by such men as Woodworth, McDougall, or Watson, representatives of the different recognized schools of psychology, it is difficult to find any real defect in the instinctive reaction of the epileptic. In fact the instincts are well developed in him. In the elaboration of this theory defect in the instinctive life of the epileptic, Dr. Clark mentions the egotism, supersensitiveness and emotional poverty of the epileptic personality. It is true that one meets with these characteristics in epileptics, but their genesis is not to be found in instinctive defects. They are to be best explained as resulting from defensive mechanisms induced by an inferiority complex. The epileptic is fully aware of his handicap in life. This induces in him a feeling of inferiority. He is quick to sense any danger. He is very sensitive, or supersensitive, in order to detect any danger in the environment that may mean destruction to him. He is quick to detect any menacing situation that may come up in his sphere of activity. Such personality is a very unpleasant one indeed, and one that is not conducive toward a frank and open relationship with one's neighbors. He becomes more or less of a social outcast, and for this state of affairs he does not seek an explanation in his own personality but in those with whom he comes into contact. This in turn tends to make him egotistical as he is constantly finding imaginary faults in those with whom he comes into contact in his effort at rationalizing his exclusion from social organizations. The emotional poverty is partly explained as a result of the traumata caused by the convulsions, and partly as a sequence to the supersensitiveness and egotism of the individual. Furthermore, we must not lose sight of the fact that there are quite a few epileptics who are very meek, altruistic, and very tolerant, and this, too, as a result of their inferiority complex, hoping to counteract their handicap by assuming such attitudes in their dealings with their fellowmen.

In the second place, I never could fully understand Dr. Clark's contention that the seizure is a mode of escape from an unpleasant situation. There is nothing more unpleasant and more serious that occurs in the life cycle of the epileptic than the convulsion. For each seizure leaves an indelible mark on the personality.

In the third place, I beg to take issue with Dr. Clark on his characterization of the epileptic delirium as a psychogenic delirium. At Bellevue, we are in most favorable position to study the various forms of deliria. There is no doubt in my mind but that the delirium associated with epilepsy is of organic nature. It resembles most closely the delirium resulting from cerebral trauma. In fact I believe that they are identical. I can never differentiate the two except from the history of the case. I believe that epilepsy is the resultant of some cerebral insult, gross or molecular structural

alteration in the brains of the individual which at present is escaping detection through the present methods of investigations. The convulsions are responses to stimuli, endogenous, exogenous, or psychogenic, sent to the highly sensitive brain of the patient. If the assumption that there are either gross or molecular changes in the brains of the epileptic be true, then one might expect to find a type of epileptic as described by Dr. Hunt to-night. Clinically, I have seen just such a type coming into the psychopathic wards of Bellevue. It is difficult to prophesy where the locus for the ultimate solution of the genesis of epilepsy lies. More facts are needed to evaluate the effect disease in the Mother on the brain of the developing foetus. Furthermore, we need more data in regard to the influence of mild infections during infancy on the developing and growing brain.

Lastly, I cannot understand how Dr. Clark persistently claims that luminal has a detrimental effect on the patient, claiming, as he does, that it causes deterioration. This is entirely different from the reports that are now literally swelling the literature. I have used luminal extensively, in not only the sane epileptic but also in the psychotic one. I have never had any such result. Not only has it failed to cause deterioration, using the word in its restricted psychiatric sense, but it has helped to clear the psychotic episode and has prevented deterioration. In only one case have I seen bad results from luminal, and that was in a young epileptic who had been receiving five grains of luminal three times a day over a period of ten weeks. That patient finally presented the typical signs of so-called "veronal poisoning." This was not the fault of the drug, but of the physician who had used it improperly.

DR. J. RAMSAY HUNT said: I would like to ask Dr. Clark his reasons for assuming that all cases of idiopathic epilepsy are psychogenic in their etiology. Epilepsy is a symptomatic manifestation which has definite associations with organic disease and intoxication of various kinds.

Why does Dr. Clark eliminate the organic and toxic factors in his interpretation of the so-called idiopathic epilepsy? Is it because no definite lesion has as yet been identified?

It is only in recent years that the pathology of paralysis agitans has been placed upon a fairly firm basis. Before this many theories were in vogue which are now no longer seriously considered. It seems to me that we are still in this period with regard to epilepsy. Let us hope that before many years have elapsed the epilepsies will also be placed on a more secure pathological foundation and then many of the theories which now engage investigators will have only an historical interest.

DR. ISRAEL STRAUSS said: I am impressed with what Drs. Hunt and Jelliffe have said. My training has made me more or less materialistic. I feel that we use the word functional as a cover for our ignorance. Further scientific investigation and progress will show us there is no such thing as functional as we conceive it to-day. There must be a material basis, whether that applies to the psychic

life or not is a question for the future to decide. It struck me, as it struck Dr. Hunt, that Dr. Clark has made an arbitrary division, conceiving that there may be and are cases of organic epilepsy, the other cases he classifies as essential or idiopathic. Let us suppose a boy of five years of age has a history of convulsive seizures. We examine that boy thoroughly and find nothing to point to an organic lesion. The metabolic studies show nothing unusual. We even study him from an endocrinological viewpoint. We can't find misplaced hair or teeth out of alignment. That case, according to Dr. Clark is idiopathic. We must then seek for the attributes of the epileptic constitution—egocentricity, poverty of emotion, hypersensitiveness, which, as Dr. Osnato said, are present in a good many of us. This makeup has led to a conflict in adaptation, so as a result of this he has developed epileptic convulsions. This would not appear to us to be a satisfactory and pleasurable solution for most individuals. If now we do not find an organic cause for the epilepsy in this boy and cannot find evidence of the epileptic constitution, what form of epilepsy would he have? Some years ago Dr. Clark would have found the explanation in the attempt of the child to go back to the uterus of the mother, and that led it to assume the fetal position in the tonic state of the convulsion. I can't see the rationale of that. If Dr. Clark will say what is a normal boy it would interest us. All boys have an ego. Most have a certain amount of emotional activity. The boy may be an organic case, but later, at the age of puberty, psychoanalysis may show that he wants to go back to the uterus of the mother and hence is an essential epileptic with an epileptic constitution. That reasoning is not scientific. In seeking the solution of the problem of epilepsy we shall have to deal with fundamental processes in the life of the organism. We can't solve it by studying the human being. I believe we must study lower forms of life from the point of cell metabolism and activity, and there lies the secret of what produces this tremendous change in the human brain. There must be something fundamental. I am surprised that Dr. Clark developed this theory. He has studied epilepsy along scientific lines and what he found was meager. Something has got to be discovered before we can go deeper into this problem. I don't believe man will be the agent for use in the study of the remarkable phenomenon.

DR. C. P. OBERNDORF said: I have not had enough experience to say whether this type of mental makeup Dr. Clark described is common and in general I hesitate in ascribing a psychogenetic origin to epilepsy. However, I have seen one interesting case of the "crumpling up" type of epilepsy mentioned by Dr. Hunt in a young man of twenty-six, six feet, two inches tall, with a very prominent chin but no other signs of acromegaly. He was playing golf when he dropped suddenly down. Since then he has had three or four attacks, in one he was cut severely by striking his face. In addition he has shown a tendency to somnolence. He falls asleep in the train, or even while talking or dancing. He is at present confronted with an emotional conflict, wherein he is Protestant and the girl

he wants to marry is Catholic. Every time on leaving the girl's house he has an attack of epilepsy or somnolence, so that he does not know what he is doing. While asleep he walked through a glass door and was badly cut. I did not wish to use psychoanalysis in this case but hypnotized him with great facility. He tells me the mental state in hypnosis is different from that in the epileptiform attacks. He has a normal sella turcica, no increased sugar tolerance or acidosis, but I think he has pituitary trouble. Two views have been taken of this disorder, glandular and psychogenic. I thought it a pituitary disorder, although the glandular influence in crumpling epilepsy has not been mentioned this evening.

DR. P. R. LEHRMAN said: The difference in the views expressed impresses me as due to the difference in the mode of approach to this problem. The organic approach has so far yielded little for the elucidation of this mental disease. Usually much time is given to the testing and retesting of a reflex but not a fraction of the time on the study of personality. I have closely followed Dr. Clark's studies and in several instances have been convinced of the truth of his observations. I know of one man of thirty-five, a Seventh Day Adventist minister, who has petit mal attacks and was diagnosed essential epilepsy after careful study at the Vanderbilt Clinic. Luminal did not help him. I became interested in his utterances while in attacks. He would then invariably repeat a Catholic prayer. This was a reversion to early training. The patient became a convert at the age of seventeen out of protest at his tyrannical father. The relationship of such a personality reaction to religious conversion is significant. I believe that the more we study the problem of epilepsy from the point of view of personality and are willing to hear what the patient says, voluntarily and while associating, the quicker we shall be able to properly evaluate the method that Dr. Clark is using in his studies.

DR. L. PIERCE CLARK (closing) said: I believe that essential epilepsy is at bottom organic, or better, constitutional. The defect at inception of the disorder is not that form of brain lesion which should be properly classed as the symptomatic pathology. This primary defect is now and perhaps may always remain nondemonstrable by our present methods of approach and study. The defect is shown in the imperfect development of the instincts of the epileptic individual as a whole and not in any one of his special functions of brain structure. My method of approach may seemingly be a regressive one and not in accord with what we may term the mechanistic studies of the immediate past. It, however, really rests upon the method perhaps first inaugurated by Hippocratic studies in epilepsy. It is essentially the psychobiologic one which includes the inheritance, the present makeup and the environmental factor. It may seemingly neglect the meticulous exactness of individual study of special parts of the brain because it maintains that we may not wrench such a function from its coöperative functioning with all other parts of the brain and the whole body as well. My fundamental postulate is that epilepsy in its entirety is a life reaction dis-

order and must be studied on this basis to approximately comprehend the nature of the functional and constitutional defect underlying the disease. It is basically a dynamic approach to the evaluation of the essential defects in brain structure cells, tracts and neural envelopes; it has metabolic and katabolic disorders in the bodily tissues. These are all but correlates of the fundamental defects of the whole epileptic individual. One may say, if we take a summation of all the isolated disordered functions of the whole brain may we not then build up a comprehensive picture of epilepsy? No. The dilemma then may be illustrated by MacCurdy's example in chemistry: Sodium and calcium when united produce common table salt whose qualities can in no wise be postulated from a consideration of the single elements before their chemical union. So there comes into being a something unpredictable from the summation of the several organs and functions of the body. The biologic study of different disease processes such as epilepsy is absolutely essential to get at the broad fact of dynamic etiology of the disorder. This manner of approach by modern scientific principles is relatively new and has far to go before neuropsychiatric problems will yield us final and satisfactory results. What I have so far brought forward in my studies is really not radically new in any one of its tenets. It is the grouping and the more exact study of the formerly loose designation of predisposition that brings a seeming novelty to the formulation and the great importance I place on the dynamics of the makeup in determining the disease as such. In regard to the study of epileptic deliria, one perhaps may not designate whether it is really psychogenic in character, from the content alone, but if one is able to show by after-analysis that the conflict revealed in deliria is removable by psychological efforts it shows for practical purposes the factors at work are probably psychogenic. If luminal really did anything more than repress the fit and cause the patient to live at a lower level of life adaptation Dr. Strauss's remarks on this part of our subject would be more pertinent. Sedatives alone can only work harm in the disease process as a whole in the long run. Even studies in the epileptic personality and makeup are not final, exclusive and inclusive; but we are on the right road and such studies properly correlated with coincident changes in all bodily tissues will give us new understanding of the disease process of epilepsy. The line of study is not dissimilar to many others in more advanced study of the psychoses. The need of united mechanistic and psychobiologic study of our problem is obvious and each will make its value felt in the final solution.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.
REGULAR MONTHLY MEETING, MARCH 16, 1922, DR. CHARLES G.
DEWEY, CHAIRMAN PRO TEM.

TWO SPINAL CORD CASES FOR DIFFERENTIAL
DIAGNOSIS.

Dr. Benjamin T. Burley described the disorders found in two men each fifty years of age. Each had developed within six or eight months an ataxic paraplegia with increasing paralysis and fatal results. The symptoms in each case indicated a lesion at about the first lumbar segment. Autopsy was obtained in each case and the pathological sections shown.

Case No. 1 showed rather more tendency to muscular atrophy of the legs although the muscular weakness was less complete than in *Case No. 2*. The objective signs of sensory disturbance were practically absent in *Case No. 1* although subjectively there was a sense of constriction about the thighs and at times considerable pain in the legs. There was partial vesical sphincter palsy, unequal knee jerks and positive Babinski on the left. Lumbar puncture disclosed a spinal fluid, straw colored, with high protein content, low cell count, rapid coagulability and negative Wassermann, *i.e.*, a fluid characteristic of Froin's syndrome. On this data a diagnosis of intramedullary spinal cord tumor was made and operation advised to relieve the pain. At operation numerous multilocular cysts connected with a glioma of the conus medullaris appeared beneath the dura in the upper lumbar levels. The tumor was not removable and the patient died a few days later. X-ray findings were negative in this case as well as in *Case No. 2*.

Case No. 2 was a robust type of man with good color and well nourished. In February, 1921, he first felt paresthesia in the lumbar region which lasted two days. Later he gradually developed a weakness of the legs with toe drop. He was able to walk until November, 1921. He never suffered severe or sharp pain and atrophy of the legs was not marked. The sphincters, however, became involved shortly before his entrance in the hospital. There were no abnormal reflexes above the waist. Positive Babinski, Oppenheim and ankle clonus were present and the abdominal and cremasteric reflexes were lost late in his disease. The tactile, pain and temperature senses were disturbed on the left as high as the mid-thigh; on the right as high as the knee. These senses were also lost in a small saddle-back area about the anus. Spinal fluid was normal in all respects and Wassermann negative. Blood content was also normal. A diagnosis of subacute myelitis was made and no operative interference advised. The patient died within three weeks of hypostatic pneumonia. The

preliminary report from Dr. Canavan gives a diagnosis of multiple sclerosis with degeneration particularly of the posterior and lateral columns. (A complete report of these cases will appear later.)

Discussion: Dr. E. W. Taylor said that in the second case the lesions involved the dorsal and the lateral pyramidal tracts in a systemic fashion, which is not that usually seen in multiple sclerosis. He asked if in cord sections the lesions were more widely disseminated. Why there was no sensory disturbance in the first case is not apparent. Apparently in the hemorrhagic destruction of the cord the sensory areas of the cord were definitely involved and if so there would certainly be sensory disturbances independent of nerve root involvement.

Dr. H. C. Solomon said he had seen both cords. Seeing the entire length of the cord shows well marked pearly areas not running systematically up and down the cord but scattered here and there.

Dr. J. B. Ayer said that at the Massachusetts General Hospital a great deal of emphasis is put on the fluid findings in connection with tumor. The fluid in the case first described was unquestionably indicative of cord compression, or subarachnoid block. Before admitting the normality of the fluid in the second he called attention to three tests not mentioned, which are of considerable importance in the differential diagnosis of such a case. First, total protein. Time and again it has been found that while the globulin might be absent or very slight, the total protein would show a marked increase. Second, certain dynamic evidence of block such as is obtained by compression of the jugular veins. Third, the goldsol reaction. About 50 per cent of the progressive cases of multiple sclerosis show the paretic zone. Concerning this last test, it cannot be relied upon as a certainty but given an otherwise normal fluid, the paretic zone goldsol curve is highly suggestive of multiple sclerosis. At the New York meeting of the Neurological Research Society, Dr. Sachs emphasized ataxic paraplegia as a very common and frequently an early symptom picture of multiple sclerosis, and this has been our experience also. He recalled one such case, operated upon in 1912 for cord tumor; necropsy showed multiple sclerosis. Multiple sclerosis must be considered as a likely diagnosis in ataxic paraplegics with a certain amount of sensory loss when associated with practically a normal fluid, but showing a paretic goldsol reaction.

Dr. W. J. Mixer said that it may be of interest to the Society to review a few statistics that he had recently collected, relative to the spinal fluid puncture findings, in his operated tumor cases during the past two or three years. In twenty-six the combined puncture has been done. In twenty there was positive evidence of block with a definite pathology. In the six cases giving negative findings there were two cases of tumor, one a metastatic carcinoma of the cord which was very small and had contracted the cord, the other a multiple cystic condition of the dura for unknown reasons did not give the signs of block. The other four cases did not show change in the cerebrospinal fluid and ultimately proved themselves, in three out of four, to have been a degenerative process, probably multiple

sclerosis. The examination of the cerebrospinal fluid, either by puncture or combined puncture, is, he thought, a most valuable addition to his surgical work.

In regard to the actual handling of tumors of the cauda equina, there is no question that tumors in this region are a very difficult type because they grow about and among the elements of the cauda equina and in many cases are impossible to remove without sacrificing valuable structures. One of his fatalities in cord tumor work has been in such a case. In another case he was unable to remove more than a portion of the neoplasm. Circumscribed tumors are comparatively easy to attack and the results are good.

Dr. Henry Viets said that the presence of a positive Babinski in the first case is of interest. The finding of this reflex in intramedullary lesions of the lower part of the cord has been described a good many times. The mechanism has not been explained so far as he knew, except in the hypothesis that an edema above the lesion could cause enough pressure on the pyramidal tract to produce the reflex.

Dr. Burley in closing said he regretted he was not able to make a diagnosis of multiple sclerosis without microscopic confirmation. He had left that matter as a pathological problem to Dr. Canavan. She has not had time to complete the work but from her preliminary examination she felt evidently very certain that it was a multiple sclerosis. At any rate it is certainly characteristic of it in many respects.

Regarding the sensory disturbances in Case 1, he had seen the case once and did not make an extended examination. It was so reported by one who did examine it very carefully and certainly there was no disturbance in the pain or temperature senses in any of the areas involved. It is, he thought, extraordinary to have so extensive a lesion in that area without sensory changes. He was interested in Dr. Ayer's remarks on the goldsol test in multiple sclerosis. There came to the Memorial Hospital a girl of nineteen years of age, who had had recurrent attacks of ataxic paraplegia for three years. She had had a characteristic paretic goldsol curve at first and also a positive Wassermann, so it was assumed to be cerebrospinal syphilis and treated accordingly. Some benefit was obtained but the paraplegia has recurred two or three times and the goldsol test has been most persistent. She had, he thought, multiple sclerosis. The symptoms suggested an intramedullary tumor. While he thought it was fair to advise operation, he was not sanguine as to the result.

CHANGES IN INTRACRANIAL PRESSURE OF THE FETUS DURING BREECH EXTRACTION

Dr. Bronson Crothers said that obstetricians, faced by a breech extraction, generally fear nothing but asphyxia. In order to avoid this danger they impose suprapubic pressure upon the soft fetal head and traction upon the delicate and elastic fetal spine. Any deaths are attributed to lack of speed in delivery.

From physiological and anatomical points of view, their argu-

ment seems unfounded. There is some evidence that adult cortical cells can be damaged in eight minutes, there is none that the fetal medullary cells, which alone are important in determining life or death, are so affected. Pathologically, in spite of admittedly inadequate examinations, there is evidence that suggests that broken necks occur in a startling proportion of cases. The changes in pressure within the craniovertebral cavity are of the utmost importance. It is obvious that they have never received adequate attention from obstetricians. The discontinuity of pressure between the supratentorial and the subtentorial portions of the cranial cavity is of vital significance and depends on the integrity of the falx and the tentorium. Unrestrained suprapubic pressure threatens these structures with rupture. If rupture occurs the full force of imposed pressure is felt by the medulla. The subtentorial pressure is normally balanced by the spinal pressure. During the pains of natural labor, the compression of the spine increases the spinal pressure and prevents impaction of the medulla. Traction substitutes negative for positive pressure, leading to impaction and anemia of the medulla.

The babies who die in delivery are regarded as dead from asphyxia. There is no evidence that this is invariably, or usually, the case. It is far more likely, I believe, that they die from trauma or from cerebral anaemia. The picture of "white asphyxia" is identical with that of cerebral anaemia and entirely different from any condition associated with asphyxia in adults or in experimental animals.

These statements are, of course, not the result of obstetrical experience, but they are supported by a considerable amount of pertinent scientific evidence. Further study is essential. For one thing, pathologists should use a technique which will allow observation of the falx and tentorium in place. Various other methods of approach are equally obvious. At present no obstetrical writer mentions, in any serious way, the central nervous system of the fetus, though it is perfectly obvious that practically every dead baby is dead because of lesions in that system.

Discussion: Dr. J. B. Ayer asked what answer the obstetricians made to this when Dr. Crothers spoke before them recently.

Dr. Crothers replied that he had not spoken to the obstetricians except individually. Most of them say it is nonsense. They say white asphyxia is a terminal stage of blue asphyxia and that it sometimes occurs within three or four minutes. However, in a series of cases in one clinic, 10 per cent of all babies born "asphyxiated" died of broken necks. Every baby was perfectly normal, as far as its heart was concerned, when extracted. Their hearts kept going for long periods, and when the autopsies were made, the babies were found to have broken necks. As examples of "white asphyxia" they were not very convincing.

NERVOUS SYMPTOMS IN PERNICIOUS ANEMIA

Dr. R. M. Shukle read this paper: Pernicious anemia is a form of fatal blood deterioration and exhibits itself clinically, as it were,

on a three-legged stool with cardiovascular, gastrointestinal and nervous involvement. This is abundantly shown in the literature. The clinical picture is characterized by extreme anemia, a pigmentation varying from a deep jaundice to varying shades of lemon color or even bronzing, a commonly preserved panniculus adiposus, transitory edema, tenderness over the flat bones, moderate enlargement of the liver and spleen, hemorrhages, anacidity from hypoacidity, especially achylia gastrica with gastric hypermotility, cardiac dilatation, subfebrile temperature, nervous symptoms and finally the characteristic blood picture, which, however, in many instances may never quite match the classic textbook description.

There is nothing constant in the relationship between the time of onset of any of the above mentioned symptoms and the so-called disease. As a matter of fact, what we call pernicious anemia may well be regarded as a symptom-complex, since it is probable that more than one etiological factor may produce this clinical picture; though viewing the condition as a symptom-complex, the writer does not regard the outlook as necessarily an altogether hopeless one.

Eight cases have been treated at the Evans Memorial during the past year and an analysis of fifty cases admitted at our hospital with the admission diagnosis not pernicious anemia shows that the grouping of the provisional diagnoses falls in three main systems; 52 per cent gastrointestinal, 22 per cent cardiovascular and 26 per cent nervous.

The eight cases which have entered the Evans Memorial during the past twelve months have showed involvement of all three systems, namely nervous, cardiovascular and gastrointestinal. The nervous findings were the most interesting in that paresthesias—especially numbness and tingling of the feet and hands—were present, regardless of whether or not involvement of the nervous system could be demonstrated objectively. Subjective sensory disturbances were present in all cases. Marked neuritic pains, paroxysmal in character, were present in several cases. Objective sensory phenomena, such as a loss of vibration sense, etc., were present in all cases, positional sense was impaired in one half of the cases only.

On studying the details of the cases under observation the writer has been impressed with the following facts: Assuming that the unknown causes such as *Bothriocephalus latus*, puerperal infection, malaria, plumbism, and others are ruled out, there still remains a large group of so-called toxemias to investigate as possible causes. That the cases with known causes are most amenable to treatment is self-evident. Nevertheless, so-called toxic cases, if treated by such means as intestinal disinfectants, gastric lavage and suitable diet show definitely marked relief in symptoms.

Pernicious anemia appears to be a syndrome or symptom-complex rather than a disease; incident to middle age, likely secondary to several conditions producing toxemia, progressive and paroxysmal in character, striking chiefly more or less simultaneously at three systems, viz., cardiovascular, gastrointestinal and nervous.

Pernicious anemia is more toxic and chronic, lasting longer in

duration than has hitherto been emphasized, since any one of the three systems may show manifestations before positive blood findings are secured, and particularly the nervous system may antedate the blood findings, thus duration being much more prolonged than has been emphasized in the past. Some of the clinical features are singularly interesting, such as persistently low blood pressure, proportionately very low diastolic making inevitably large pulse pressure and comparatively constant lymphocytosis rather than eosinophilia, relatively high in view of leucopenia. The physician is as much at a loss to attribute the various vague symptoms, as put forth by the patient, to any one of the three systems involved, thus reaching a typical diagnosis of this or that system, as is the patient to describe them. This factor in itself is a clue to chronic or subacute toxicosis, conducive to the below-par functioning of the systems involved.

Treatment, such as absolute rest, hydrochloric acid, digitalis, suitable diet, lavage, enemata, etc., though of necessity chiefly palliative and by no means curative or specific, if directed towards aiding the function of the three systems involved and in reducing toxicity, gives the best results. It may be that germanium dioxide will prove to be a potent palliative factor.

In this paper there has been no attempt to draw any conclusions, the writer merely has presented such clinical findings and aspects as have been gathered from the cases in the hospital. The writer, therefore, concludes with this quotation from Cabot, "That the incidence of the disease is a good deal a matter of keenness on the part of the practitioners of any district". Are not then, the correlated clinical findings of utmost importance?

Discussion: Dr. Henry Viets said this is a very stimulating paper. It has brought out a number of points that have come to light only in recent years. It is interesting to go back over the history of pernicious anemia and to realize that fifty years ago, the first cases with spinal cord involvement were described as tabes associated with anemia. As time went on, in the early part of the twentieth century, many cases of diffuse combined degeneration of the spinal cord were described as associated with anemia, but not definitely with pernicious anemia. The early cases described by Dr. J. J. Putnam and Dr. E. W. Taylor were of such a classification. In the last twenty years the blood pictures in these cases have been more carefully studied, and the numbers of cases of diffuse combined degeneration associated with pernicious anemia are much greater than they have ever been before. In other words, a blood picture is being found substantially characteristic of pernicious anemia in many of the combined degeneration cases, because hematologists are willing to make a diagnosis from the blood picture to-day that would not have been considered characteristic of pernicious anemia ten years ago. Whether all of the neurological cases of diffuse combined disease are going to be considered cases of pernicious anemia or not is something for the future to decide. The tendency to bring them together is certainly very marked in the recent literature.

Dr. Shukle did not bring out especially, although it is rather important from the neurologist's point of view, the point in regard to the changes in the spinal cord picture that may take place. Some cases recently described had a very sudden onset; so rapid was the development of the ataxic paraplegia, that transverse myelitis was considered and some cases were thought to be questionable spinal cord tumors. As to the early spinal cord involvement, Dr. Shukle has brought out that 26 per cent of his cases entered the hospital with the spinal cord symptoms as the predominating feature of the case. That has been emphasized recently in the literature from other clinics. One case studied by Bramwell showed a spinal cord picture three years before the blood picture demonstrated it to be a case of pernicious anemia. He studied this case very carefully with frequent blood examinations and after the three year period the blood became characteristic of pernicious anemia. The neurologists, therefore, should be on the outlook for this disease even before the blood picture shows characteristic changes.

Another point which seems very important in regard to neurology is the loss of vibration sense. This is found in practically every case. It has been thought to be due to the fact that the longer and the more centrally placed fibers in the posterior columns are the ones to be affected. The lesion is more often marked in the center of the posterior column than in its peripheral aspect. If those fibers carry the vibration sense, the pathological picture is as one would expect to find it.

Dr. J. W. Courtney said that pernicious anemia is, to date, about the most elusive problem with which medical science has to deal. It is useless to consider the treatment of its nervous manifestations seriously until biochemistry succeeds in furnishing dependable data concerning the blood. The morphologic peculiarities of the blood in the disease in question are thoroughly well known, but this knowledge aids not all our understanding of the ischemic changes in cord and brain. Before neurology can cope intelligently with these changes it must be known definitely whether they are nutritive or toxic in origin. He had several times observed a marked dissociation between the cord lesions and the blood state—in other words, he had seen these lesions go steadily on in spite of marked improvement on the part of the blood. Phenomena of this sort confirm the statement with regard to the subtlety and elusiveness of the whole problem.

Dr. Hugo Mella asked Dr. Shukle if he had studied cases of secondary anemia. He had seen some of these changes in cases of secondary anemia where, later, the signs cleared up and the anemia was cured.

Dr. Shukle said in response to Dr. Mella that it is a question of upon what one makes the diagnosis of pernicious anemia. So soon as the cause of the anemia is found it is called secondary anemia, for on removal of the cause the anemia is corrected.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY: THE NEUROLOGY OF METABOLIC PROCESSES.

1. VEGETATIVE NERVOUS SYSTEM.

Moore, A. R. STEREOTROPIC ORIENTATION OF THE TUBE FEET OF STARFISH (*ASTERIAS*) AND ITS INHIBITION BY LIGHT. [Journ. of Gen. Physiol., IV, 163-169.]

The stereotropic reaction of the tube feet of starfish may be demonstrated by laying the animal on its back in a dish of sea water and preventing it from righting. If now a contact stimulus is applied to one of the rays by pressing a foreign body such as a piece of cork or a glass rod against the side of the ray, a retraction of the tube feet occurs, followed by closure of the ambulacral groove. Next the groove opens and the tube feet extend toward the stimulated area. The average latent period between the moment of contact excitation and protrusion of the tube feet is 2.8 seconds. The circumoral nerve ring plays no part in the reaction, but only the radial nerve, since the experiment can be made on isolated rays.

If two points on the same side of the ray but at a distance from each other are touched, then the tube feet turn to that side. Those midway between the two loci of stimulation bend neither toward the one nor the other but at right angles to a line joining the two points. In this we have a tropistic reaction analogous to that of the heliotropic orientation of an organism to two sources of light. The same principle is shown if the ray is pressed gently between two glass rods. When the tube feet extend in response to this excitation only those in the immediate vicinity of the points stimulated bend laterally. All of the other tube feet bend along the axis of the ray toward the area of excitation. If the pressure of the two glass rods is increased, the tube feet central to the point of stimulation reverse their orientation and bend toward the center of the starfish, and away from the area of stimulation. It is clear, therefore, that when acted upon by contact on two opposite sides of the ray, the tube feet orient themselves along a line perpendicular to a line joining the two loci of stimulation. This again is a case analogous to that of heliotropic orientation to two sources of light, since the starfish ray, like the heliotropic insect, is bilaterally symmetrical with reference to right and left.

The extended tube feet of a starfish withdraw if they are subjected to a sudden increase in the intensity of illumination. Experiments car-

ried out in the dark room showed that tube feet with well-developed terminal pads alone were sensitive to light. Other parts of the ray were not. The shortest reaction time obtainable with a light intensity of 26,000 candle-meters was 1.5 seconds. The longest reaction time secured with a weak light was three seconds. If the light intensity was so low that an exposure of more than this length of time was necessary to produce the required photochemical effect, no reaction was obtained. The minimum quantity of light which would cause withdrawal of unattached tube feet was found to be 10 to 25 candle-meter seconds. Even when the tube feet were attached to a surface it was possible to cause them to loose their attachment as the result of sudden illumination—stereotropism could be inhibited by light.

Determinations of the amount of light energy necessary to inhibit stereotropic attachment of the tube feet were made by putting each starfish into a rectangular glass dish filled with sea water. The animals were allowed to attach themselves to a vertical side of the dish. Then light of known intensity was thrown perpendicularly on this side for a known length of time. The minimum quantity of light which would cause withdrawal of the tube feet from the glass surface is termed the photic equivalent of stereotropism. This quantity of light was found to vary between 250 and 350 candle-meter seconds. [Author's abstract.]

Guillaume. PATHOLOGY OF THE SYMPATHETIC SYSTEM. [Bull. Méd., Feb. 25, 1922, XXXVI, No. 9.]

Guillaume remarks that the neuroglandular system of the vegetative life of the organism has only a very modest personal pathology, but it intervenes in all the pathologic conditions of this organovegetative life. Hence the pathology of the organs and tissues which pertain to this vegetative life is the pathology of the sympathetic system, just as its pathology is theirs.

Crile, G. W. STUDIES IN EXHAUSTION: III. EMOTION. [Arch. of Surg., January, 1922, IV, No. 1.]

Crile continues his experimental work upon the fatigue due to crude emotional factors. He states that the emotions drive the organism with extreme intensity, which every thinking person has known since thinking has been recorded. Like trauma or exertion, emotion may drive the organism within the limits of normal response, or so overwhelmingly as to suspend the normal functions and reduce the individual to a state of complete, cold prostration. In other words, emotion may cause exhaustion; it may cause shock. Histologic lesions are produced in the brain, liver, and suprarenals by emotion. Crile deals with conscious and more or less evanescent emotional factors. It is a corollary that continuous unconscious emotional factors, such as Jelliffe shows in his "paleopsychological" researches, are efficient factors in the production of organic disease.

Müller, Erik, and Ingvar, Sven. ON THE ORIGIN OF THE SYMPATHETIC IN THE AMPHIBIA. [Opsala Läkarförenings förhandlingar, Bd. 26, h. 5-6, 1921.]

In spite of the fact that a whole series of very prominent authors have investigated the origin of the sympathetic nerve, the question is not yet by any means solved. The cause is the insufficiency of the descriptive morphological methods. Some investigators consider the sympathetic ganglia to develop directly from the mesoderme, but the majority are of the opinion that it derives ectodermally, i. o. w., from neuroblasts that in early embryonic stages leave the neural tube. With the method originally described by Harrison the authors removed in young tadpoles the dorsal, that is, the sensory part of the neural tube with the ganglionic crest. These operated animals developed no spinal ganglia but also no sympathetic ganglia. They remained without a sympathetic nervous system. In other specimens the ventral motor part of the neural tube was removed. After this operation no ventral roots were seen but spinal and sympathetic ganglia. Thus for the first time the proof has been given with an exact method that the sympathetic in the frog originates from the ectoderm and that the migration takes place along the dorsal root. [Author's abstract.]

Rugh, J. T. EFFECT OF MENSTRUATION ON DISEASE. [Pa. Med. Jour., January, 1922, XXV, No. 4.]

This author has a glimpse of the idea that the body is a unit and not a series of independent organs. All must be surveyed, and he states that whatever may be the changes which occur during the process of menstruation, and however they may be produced, the influence of the menstrual cycle is felt in all the other bodily segments, especially in a segment which is not functioning well, *i.e.*, diseased. The surgeon must be prepared to deal with whatever complication may arise at that time. It is undoubtedly good surgery to advise against, and refuse to undertake any surgical procedures of any degree of severity, immediately preceding or during the period of menstruation.

Carey, Eben J. STUDIES IN THE DYNAMICS OF HISTOGENESIS.

1. The differential degree of energy possessed by the types of muscle is purely an embryological biomechanical problem corresponding to the diverse amounts of optimum tensile work that has been expended in their formation by a dominant extrinsic energetic zone which draws out the premuscle mesenchyme in traction between the points of attachment at least one of which is mobile.

2. The elongation of the muscular fasciculi is in the direction of a dominant force extrinsic to the zone of myogenesis, just as the strands of a mass of taffy candy are in the direction of the diverging supports—the hands.

3. The essential difference between the pale smooth muscle of the

bladder and the red involuntary striated muscle of the heart is dependent upon the differential intensity of hydrodynamic tensional stimuli to which the vesicular and cardiac mesenchymal syncytia, respectively, have been subjected during development.

4. The evidence herein presented proves definitely that the pale bladder musculature may be transformed into the red, cross-striated type by increasing the tensional stimulus to a degree comparable with that which the cardiac mesenchyme experiences normally.

5. Muscle tissue is not a self-differentiated product, but is a bio-mechanical resultant of an optimum tension. The variable intensity of the optimum tension determines the muscular type. The growing cells receive and respond to the mechanical tensional stimulus. The stimulus, however, is a function of position.

6. In considering the origins of the heart beat, the extrinsic hydrodynamic tensional stimulus as well as the irritable reacting body—the heart muscle—is shown to be absolutely necessary as one of the factors accountable for heart rhythm.

7. The evidence herein presented proves that the structure of striated muscle is determined by the function it performs and the work it does, and that cross-striated muscle is not formed in anticipation to a future function. The conclusion is warranted that function in this case determines structure, and not the reverse. [Author's abstract.]

Depisch, F. A CONTRIBUTION TO THE PATHOLOGY OF THE VEGETATIVE NERVOUS SYSTEM (CASE OF BULBAR DISEASE WITH VEGETATIVE IRRITATION OF ONE SIDE). *Zeitschr. f. d. ges. Neurologie und Psychiatrie*, July, 1920.]

Forty-two-year-old female patient with tuberculous inheritance. Pleuritis fourteen years previously, nine years before, beginning of a chronic polyarthritis. For some years the left cheek redder than the right. Since then also attacks of vertigo as regards external objects. Urinary difficulties. Marked slowing of pulse in form of attacks. Summary of status in the course of an observation of three-quarters of a year: Beside a chronic polyarthritis the following symptoms were observed: 1. Lowering of the skin temperature of the trunk and the extremities on the left side (an average of 1°C.). 2. Elevation of the temperature of the skin of the left half of the face and dilatation of the retinal vessels left. 3. Increased secretion of sweat left. 4. Reversed Horner's symptom complex left. 5. Increased salivary secretion left. 6. Increased tear secretion left. 7. Symptoms of vagus irritation. 8. Symptoms of irritation of the heart sympathetic (vagus paralysis)? 9. Vertigo from left to right. 10. Pains in the head in the occiput left. 11. Increased tonus of the sphincter vesicae? 12. Slight increase of the P. S. R. right and sign of Babinski right. 13. Slight ataxia of the left upper extremity. 14. Temporary weakening of the left abdominal reflex.

Epicroses: Symptoms 1, 3, 4, 5, 6 are doubtless the expression of a

hemilateral irritation of the vegetative nerves. In 2, 7, 8, 11 one can only surmise this. The location of the causal disease must be centrally placed on account of the marked hemilateral character of the symptoms and on account of involvement of the entire left half of the body. The aural investigation by Dr. Fremel shows "an organic lesion in the region of the left Deiter's nucleus." All the symptoms of the patient as far as 1-3 can be explained, according to our experience up to this time, through such a lesion in the left half of the medulla. According to Babinski, Senator, and others, there will indeed be observed on the side of the lesion in hemilateral medullary lesions in the head region vegetative disturbances in the region of the trunk and the extremities. But they will be found on the contralateral side from the lesion that is on the side of the motor disturbances.

Whether in our case all symptoms can be explained through the one left-sided lesion surely present or whether perhaps one must assume a second lesion at the right which acts only upon the vegetative tracts for the trunk and the extremities, cannot be surely decided. We hold the first assumption for the more likely. The literature which exists in relation to this, with consideration also of my own case, as well as of a similar case of Pappenheim not yet published, brings us to the following opinions concerning the central course of the fibers of the vegetative paths, especially as concerns their decussation:

1. In man the vegetative paths going out from the cerebrum undergo decussation on their way downwards.

2. The decussation has already taken place for the lowest segments of the cervical spinal cord.

3. The decussation of the path for the eye sympathetic and the vasomotor and sweat paths of the face must take place between the inner capsule and the pons.

4. The decussation of the path for the vasomotors and the sweat glands of the trunk and extremities appears to be located in the upper segments of the medulla oblongata. [Author's abstract.]

Doerr. IDIOSYNCRASIES. [Schweiz. med. Woch., Oct. 13, 1921, LI, 41.]

Any enumeration of individual idiosyncrasies would not only be confusing but impossible. The substances which give rise to them differ radically among themselves. A particular individual is hypersensitive toward a particular substance. Many idiosyncrasies are monovalent, while in others any member of a group may induce it. In the case of food idiosyncrasy in which many dishes may induce the same picture we do not speak of polyvalence because only the food protein in certain forms is the agent. In certain cases there is nothing specific, for it is not the quality but the quantity of protein which is at fault. Plant protein as a cause of idiosyncrasy is as well known as animal, but when we come to drugs as causal factors a different element enters. The content of nitrogen plays no rôle. The active factor is chemospecificity and

there is a relation between the idiosyncrasy and the constitution of the molecule. In a large group of drugs which may cause idiosyncrasy it is the methyl group in the molecule which is actually at fault. Methyl specificity may be traced in a given individual through a number of substances. In certain cases of occupational idiosyncrasy the offending substance if traced may be found to contain the methyl radical and protein if present may be inert. Thus far the author has considered natural hypersensitiveness without reference to anaphylaxis. The relationship between anaphylaxis and idiosyncrasy is still somewhat obscure. In anaphylaxis the first step is the presence of a substance known as the antigen, which introduced parenterally causes the formation of an antibody. In a true idiosyncrasy the offending substance does not ordinarily come under the head of an antigen and no antibody is generated by it. Laboratory animals have no idiosyncrasies like mankind and anaphylactic behavior is constant for the species and in no sense an individual phenomenon. This is probably the chief distinction between the two. In practice, just as animals may be desensitized to laboratory anaphylaxis man may be desensitized to an inborn idiosyncrasy, but the process is more difficult and uncertain of result. In protein idiosyncrasy the subject may rarely show the presence in the blood of antibodies just as in anaphylaxis. In true protein idiosyncrasy the eliciting substance is of the same nature as the antigen which sets up anaphylaxis, although there has been no previous sensitization. This appears to be the bond or one of several bonds between the two processes. The active principle in both is an antigenic protein substance acting on different types of subject. But when we come to nonantigenic, chemospecific drug action, Doerr says, there is nothing in common with anaphylaxis.

Walshe, F. M. R. THE ELEMENTARY NERVOUS SYSTEM. [Medical Science, 1921, p. 14.]

Walshe here contributes an excellent review based upon a number of recent works on neurology, coördinating them with the older work of Hughlings Jackson (*Br. Med. J.*, 1884, I, 591, 660, 703) on Evolution and Dissolution of the Nervous System, and of Sherrington on the Integrative Action of the Nervous System, 1906. The more recent volumes are those of Parker on the Elementary Nervous System, Head's Studies in Neurology, and Rivers' Instinct and the Unconscious, all of which have been reviewed in these columns, but by reason of their value a second consideration seems of service.

It has been aptly said, writes Walshe in this review, that the edifice of the whole nervous system is reared upon two neurones, the afferent root cell and the efferent root cell. These are the pillars of the fundamental reflex arc, upon which all the other neural arcs are superimposed, even those of the cerebral cortex. It is with the development of these anatomical and physiological foundations of the nervous system, in those simple animal forms in which they first make their appearance, that

Parker deals in his book. Beginning with the sponges, in which contractile muscle-tissue develops as an independent effector organ before any nervous elements have been differentiated, Parker passes to the coelenterates—hydrozoa, sea anemones and jelly-fish—in which there is a receptor-effector system consisting of sensory and motor elements with their appropriate receptor and effector organs. In his concluding chapters, he describes the earliest manifestations of centralization in the diffuse nerve-net of these primitive animals, and the appearance of internuncial nerve-cells placed between sensory and motor elements.

Not only does he deal with the morphology of this primitive neuromuscular mechanism, but also with its modes of response. This physiological aspect of the question is perhaps of even greater interest and importance to the neurologist than the purely anatomical. At the present moment there is a great need for accurate and extensive observation upon the nature of the reactions characteristic of the elementary nervous system, and this for reasons which call for some preliminary explanation.

Dissolution of function in disease of the nervous system. Within the past few years, the systematic investigation of the phenomena of nervous disease has thrown considerable light upon the functions of this system, and upon the manner in which disease disorders them. Clinical neurology in this country has never been satisfied by the mere description and classification of the symptoms of disease, but has always attempted to interpret these in terms of disordered function, and by their study to throw light upon the physiology of the nervous system. In this way many notable advances have been made, as, for example, in our knowledge of the problems of sensation and of the coordination of muscular movement. Nevertheless, many problems await solution, and probably many more have yet to be recognized.

It is in respect of certain hypotheses concerning the evolution of function in the nervous system, and based upon clinical observations, that the investigations made and so admirably recounted by Parker promise to be of the greatest value.

These hypotheses are founded upon a general principle enunciated by Hughlings Jackson many years ago, to the effect that, for purposes of investigation, nervous disease might be regarded as a reversal of evolution, that is, as a dissolution, in which function is "taken to pieces" in a definite fashion; the highest and most recently acquired activities being earliest and most severely affected, the lower, more automatic and more deeply organized activities being more resistant. Further, such a dissolution being partial—when death does not ensue—the symptomatology of nervous disease must be dual; there will be a negative or defect symptomatology due to loss of function in the center destroyed or inactivated, and a corresponding release from control and unbalanced activity of subordinate centers which remain intact. In other words, disease dissects out the functional components of the activity of the nervous system, and

from the study of the lower levels of evolution remaining, light may be thrown upon the gradual evolution of function in the nervous system.

Fruitful as this guiding principle has been, there is clearly a danger that it may be labored, that it may be applied beyond its capacity in the endeavor to determine the physiological meaning of symptoms. For example, the hypothesis makes no provision for qualitative alterations of function, or perversions of function. To apply it universally means that we accept defect and release as a complete explanation of all the symptoms of disordered function that we see in nervous disease. Surely this is an assumption we have no right to make. Be this as it may, the principle is widely accepted as universally applicable, and certain important corollaries have followed from this.

The one with which we are now concerned is that this supposed dissolution of function unmasks earlier phases in the evolution of nervous activity. Thus, in their well-known work on peripheral sensation, Head and Rivers maintain that the "protopathic" sensibility remaining at the periphery of a denervated area of skin, and present throughout this area at the end of the first stage of regeneration, represents a primitive form of sensibility; disease or injury has dissected normal cutaneous sensibility into two physiological components of widely differing capacity and far removed in phylogenetic origin. Similarly, the reflex activity of the isolated segments of the divided spinal cord in man have been regarded as representing primitive motor activities released from higher control and reappearing in their primitive form (Head and Riddoch). In other words, in protopathic sensibility and in the "mass reflex" of spinal man, we see approximations to the sensori-motor reactions of a primitive animal. In his recent book, "Instinct and the Unconscious," Rivers has fully expounded this biological aspect of the subject and has summed it up in the following words: "All we know of the protopathic stage is consistent with its being the representative of the sensibility of an animal which possesses only the power of becoming aware of changes of a crude kind and, according as these changes are pleasant or unpleasant, of reacting at once by such mass-movements as would take it nearer to, or remove it from, the source of stimulation." (Rivers, p. 23.)

How far do the facts of observation, as recorded by Parker, confirm this view? Clearly they should afford us a valuable means of assessing the significance of the phenomena described by Head and his coworkers, and further, of deciding whether the Jacksonian principle, upon which their conclusions are based, can be safely applied to all the phenomena of nervous disease.

The "protopathic" animal. With this end in view, let us briefly examine the sensori-motor endowment of the hypothetical "protopathic" animal. *Protopathic sensibility* is a high-threshold form of cutaneous sensibility, responding solely to pain and to extremes of temperature. (Head, Rivers, and Sherren, p. 63.) It carries no power of localizing a spot stimulated; no power of appreciating intensity of stimulus, for

the sensations perceived are of the "all-or-none" kind; there is no power of determining the nature of the stimulating object, beyond the fact that it may convey a pleasant or unpleasant feeling tone; sensations radiate widely and are often erroneously localized at a considerable distance from the spot stimulated. In short, to use Rivers's words, protopathic sensibility contains "elements of vagueness and confusion quite incompatible with the exact power of localization. * * *" (Rivers, p. 30.)

To what type of reaction does this extremely strange and restricted form of sensibility lead? Head and Riddoch observed that after division of the spinal cord, the isolated portion, having emerged from the state of spinal shock, shows an intense reflex activity. They discerned in this many points of resemblance to protopathic sensibility. Thus, "the situation of the stimulus does not determine the distribution of the response; local signature is abolished, and the outburst of energy flows into channels that would be blocked under normal conditions." (Head, p. 753.)

The reflex response invariably obtained under these circumstances consists of powerful bilateral flexion of the legs, contraction of the abdominal muscles, evacuation of the bladder, and an outburst of sweating. This is elicited by all forms of stimulation applied anywhere below the level of the cord lesion, to skin or to deep structures. The response is stereotyped in form and unvarying in intensity. Should the stimulus be gentle friction of the glans penis, bladder evacuation is replaced by erection and seminal emission. This type of "*mass reflex*" has been called "the coitus reflex." Apart from this single exception, "all local adaptation to the site or nature of the stimulus is swept away in a violent outburst of energy in centers cut off from higher control." (Head, p. 758.) And again, "a reaction of this kind is admirably fitted to defend the animal from noxious influences; it produces movements of withdrawal, which permit of no choice." (Head, p. 752.) Finally, and scarcely consistently, "both the segmental and the massive response are means of defense and lead to withdrawal of the part from noxious influences. But they hamper voluntary action by the uncontrolled movements they evoke, and tend to prevent escape by fixing the body in a position unfavorable for flight. The animal crawls into a hole to die or to recover. * * *" (Head, p. 753.) The "mass reflex" is said to represent the reappearance "in its primitive form" of an elementary motor mechanism normally kept under control.

It is very difficult to regard this chaos of reflex responses as anything but a pathological demonstration of what might aptly be called spinal anarchy. The protopathic animal, in response to a stimulus which it cannot localize, which has but a single intensity and gives no information as to the nature of the stimulating object, makes a response which consists of profuse sweating, bladder evacuation, and powerful tonic flexion of the hind limbs, or squatting. The primitive animal thus endowed would be an organism utterly unfitted to cope with its environment. So helpless and bewildered a creature could not survive long enough to perpetuate its

race, even if it could make an effective effort to do this, and with its appearance the process of evolution must almost inevitably have ceased.

These reflections are forcibly suggested by the biological consequences of this theory of the dissolution of function. Let us see what actual observations upon the physiology of the elementary nervous system have to say on this point.

The elementary nervous system. In the case of such a primitive animal form as the jelly-fish, or the sea anemone, we can determine the presence of graduation and localization of sensation only by a close study of the characters of the response. In these animals there are several forms of effector organ, but of these only the muscle is under nervous control. We must therefore study the motor responses of these animals.

If the sea anemone *Metridium* be stimulated at any point by a glass rod, the whole musculature of the animal goes into strong tonic contraction. If, however, we employ physiological stimuli, finely graded motor reactions may be observed. "If a *Metridium* be allowed to remain for some time in running sea water in a situation relatively dark, its muscular tonus will be reduced to a minimum, and it will assume the condition of fullest normal expansion. If, under such circumstances, it is generally and briefly illuminated, it will quickly shorten its length quite noticeably, though it will by no means go into what would be described as a state of contraction. This shortening of the animal as a whole is due to the simultaneous moderate contraction of its longitudinal mesenteric muscles. The fact that the shortening is symmetrical and uniform shows that a complete ring of these muscles has contracted in unison. If, instead of subjecting the fully expanded sea anemone to a general illumination, light is thrown on only one of its sides, it responds usually by turning its oral disc toward the light, precisely as some flowers come to face the light * * * hence the nerve-net exhibits under a more normal form of stimulation a type of response much more delicate in character than what is seen when a glass rod is used." (Parker, p. 100.) Finally, Parker concludes that the responses of such an animal are not of the "all-or-none" character, but are finely graded according to the strength and the site of the stimulation.

The response of the tentacles to stimulation show the same features as those of the musculature of the wall of the organism. (Parker, p. 122.) Further, according as we stimulate the tentacles of the sea anemone with either weak acid or with fish meat, so the whole nature and site of the response differs completely.

Finally, in the tiny polyp *Corymorpha*, Parker has observed the following delicately localized and graded response to localized stimuli (p. 189): "If a faradic stimulus is applied to one side of the stalk next the hydranth or next the base, the stalk simply shortens as a whole. If, however, the stimulus is applied to one side of the stalk nearer the middle of its length the stalk bends to that side and usually presses the hydranth with great accuracy against the stimulated spot. This response is not

only appropriate for the particular side stimulated, but also in most cases for the given level of the stimulated spot on that side. The significance of these responses to localized stimulation were often observed in the stock aquarium. This contained by accident a number of small nudibranch gastropods, which were found to feed upon the substance of *Corymorpha*. When one attacked a *Corymorpha*, it began near the base of the stalk where the hydroid rose from the mud, and as soon as it started to nibble the stalk on a given side the *Corymorpha* responded by applying to the point of attack the hydranth, the tentacles of which were extremely stimulating to the nudibranch and usually drove off the intruder. *The success of this form of protective response naturally depended upon the accuracy of the localization.* * * * This accurate form of response of a distantly located organ to a circumscribed stimulus has all the characteristics of a reflex. * * *

Differentiation and integration. Therefore, it seems that from its earliest origin, the nervous system is capable of assuring a perfect though simple coördination. Sherrington has emphasized that a simple act of coördination may be as perfect as a highly complex one, and that, as differentiation of the organism takes place, the integrative activity of the nervous system keeps pace with this differentiation. The so-called "crude" forms of activity, which Rivers supposes the elementary nervous system to possess, are nowhere to be observed throughout the animal kingdom, whether we study jelly-fish, insects, or man. Indeed, the use of the word "crude" in this connection is greatly to be deprecated. It means almost anything and therefore defines nothing, and it has no more place in biology than that quaint figment "the protopathic animal," whose nervous system it describes. The elementary nervous system may be simple and limited in its range of action, but crude never.

Indeed, it seems clear that in respect of insect behavior Rivers is conscious of some discrepancy between his hypothesis and the observed facts and he assumes that the finely discriminated and graded reactions of insects must have been derived from "originally crude modes of response" under the influence of some unknown "graduating mechanism" (p. 50). We cannot refrain from asking whether this way of looking at things is likely to lead us any nearer to a solution of these interesting problems. We can find no reason for these two assumptions, unless it be the requirements of an hypothesis which is not in accord with the facts. Surely, a more promising line of advance would be rather to study the reactions of the elementary nervous system and to base our theories on what we observe, than to roll this academic hypothesis before us, Sisyphus-like, in our efforts to attain objective truth.

To these principles which Sherrington has emphasized, and to these facts of observation, the whole conception of protopathic forms of sensibility and motor reaction runs directly counter. What is of even greater importance is that this wide diversity between the hypothesis of Head and his coworkers in this respect and what we actually know of the

elementary nervous system, shows that the Jacksonian principle is a fallible instrument if it be employed as a universal law, which Jackson surely never intended, instead of as a working hypothesis to be used with discrimination. In our future interpretations of the symptoms of disordered nervous function, we shall have to take account of the probability that function is sometimes qualitatively altered or perverted in a fashion not to be explained along these simple lines. [F. M. R. W.]

Terrien. PARALYSIS OF CERVICAL SYMPATHETIC. [Presse Méd., Jan. 22, 1921, XXIX, No. 7.]

The complete clinical picture of paralysis of the cervical sympathetic, as observed in animal experimentation, is rarely encountered in clinical neurology, although the recent war experiences came nearer to it than heretofore. In this study of twenty-two cases the animal picture was not duplicated. [Why should it be? Man is a more complicated animal than the lower animals, and why continue to look for exact similars in such widely diverging groups? The whole of laboratory physiology is vitiated by forgetting this principle. Ed.] There was miosis in all and enophthalmos in all but two, but there was hypotonia of the eyeball in only two. Other eye and pupil symptoms, vascular and trophic derangement were observed in some, as also a number of phenomena at a distance, associated disturbances. The vascular symptoms soon subside but the ocular signs persist.

Throckmorton, Tom B. LESIONS OF THE CERVICAL SYMPATHETIC. Report of three cases. [Journal Iowa State Medical Society, Vol. XI, No. 12.]

Under the above caption, the author reports three cases of cervical sympathetic involvement. In one case, the paralysis was due to malignancy involving the pectoral, axillary, neck and lung regions on the right side, and produced the typical syndrome of a right cervical sympathetic lesion, *i.e.*, myosis, pseudoptosis, enophthalmus, anidrosis and loss of the ciliospinal reflex. The patient was a white female, aged forty-seven years, who had undergone amputation of the right breast some four years previous for supposed carcinoma. Another case presented only the ocular phenomena of myosis and pseudoptosis as clinical evidence of sympathetic involvement. This patient was a white female, aged thirty-two, a primipara, who developed about the eighth month a toxemia of pregnancy. A day or two following a Caesarean section the right pupil became myotic and was associated with a pseudoptosis of the upper lid. These findings were still persistent at the time of last examination some months following. The author believes, in the absence of other demonstrable cause, the paralytic symptoms here encountered were due to the severe toxemia and as such bore out the findings of Harner and Michael that sympathetic paralysis may occur during the puerperal state. In the final case reported, the symptoms of sympathetic involve-

ment were of an irritative rather than of a paralytic nature. A male child, twenty-eight months of age, showed dilatation of the right pupil, with an internal squint of the left eye. The child was somewhat backward in its development, slow dentition, still wearing napkins, and saying only a few words. At eighteen months of age was seriously ill with measles, and later developed pertussis, with a resulting cough that lingered for several months. At two years of age a tendency for the left eye to turn inward was noticed, and at about the same time the right pupil became enlarged. Light percussion over the upper sternal region elicited moderate dullness extending beyond the lateral borders, which finding stimulated the taking of a skiagram of the chest. The presence of an enlarged thymus gland was thus readily demonstrated, and a few X-ray treatments over the thymic area produced diminution in the size of the gland with a subsidence of the pupillary dilation. In this case the author believes the pupillary dilation to be due to an irritative lesion involving the oculopupillary branch, and that had the pressure from the enlarged thymus persisted, sooner or later symptoms of a paralytic nature would have supplanted those of an irritative kind. The inward squint of the left eye was due to an improper muscle balance and bore no relation to the symptoms produced by the enlarged thymus. Four illustrations accompany the article. [Author's abstract.]

II. SENSORI-MOTOR NEUROLOGY.

7. BRAIN—BRAIN TUMOR—BRAIN ABSCESS.

Roubier and Brette. A CERVICAL MENINGEAL TUMOR. [Lyon Médical, November, 1919, p. 554.]

The authors report to the Medical Society of the Lyons Hospitals a case of cervical meningeal tumor in a man aged forty-eight. For six or seven months he had pseudoneuralgic cervicobronchial pains radiating into the whole of the left upper extremity; later, he had spastic paraplegia, more marked on the left side, with an Aran-Duchenne amyotrophy of the small muscles of the left hand, followed afterward by similar atrophy in the right; there were no oculopupillary signs; in the final stage the paraplegia in extension tended to pass into flexion; then appeared sphincteric and trophic signs which led to the patient's death a year after the onset. The diagnosis was a meningeal tumor compressing the spinal cord. Necropsy showed a subdural tumor, of the size of half an almond, extending from the seventh cervical to the first thoracic spinal segment; histological examination showed it to be a myxosarcoma. In this case Pott's disease, disseminated sclerosis, amyotrophic lateral sclerosis, syphilis, and hypertrophic cervical pachymeningitis were successively ruled out in diagnosis. The absence of objective sensory changes was due to the fact that the tumor was localized **entirely on the ventral aspect** of the cord. The Aran-Duchenne atrophy pointed to

involvement of the eighth cervical and first thoracic segments; and the bilateral inversion of the triceps-jerk showed that the seventh cervical segment was compressed by the tumor. The spinal fluid showed a hyperalbuminosis but no lymphocytosis. As the diagnosis of a meningeal tumor was reached only gradually, operation was not at first considered, and by the time the diagnosis was made the patient's condition would not permit intervention. In addition, the site of the tumor in the ventral region of the cord rendered its extirpation difficult. [Leonard J. Kidd.]

Pallasse. TUMOR GIVING ONLY VAGUE PSYCHICAL SYMPTOMS AND BLINDNESS. [Lyon Médical, December, 1919, p. 621.]

The author has reported to the Medico-Chirurgical Society of the Lyons Hospitals the case of a woman, aged fifty-seven, whose earliest symptoms were pains in the lower limbs attributable to a phlebitis. On her entry into hospital she was completely blind, with double optic atrophy, and psychical symptoms of demential type which made it very difficult to question and examine her satisfactorily. There were no signs of tabes, and her gait was normal. The urine and the cerebrospinal fluid were normal, and there was no Wassermann reaction in the spinal fluid. She fell gradually into a state of mental torpor with immobility; no convulsive attacks. She died six months after admission. Necropsy revealed an enormous tumor, weighing 150 grammes, localized on the inferior aspect of the frontal lobes, adherent to the base of the skull; but it was easily detached. Histological examination showed it to be a sarcoma of the meninges. [Leonard J. Kidd.]

Cruchet and Anglade. GLIOSARCOMA OF LEFT TEMPORAL LOBE CAUSING RIGHT HEMIPLEGIA, DYSARTHRIA, AND PARAPHASIA. [Gaz. Hebd. Sci. Méd. de Bordeaux, 1919, XL, July 20, p. 176.]

The writers reported to the Bordeaux Medical and Surgical Society on June 6, 1919, a case of a gliosarcoma of the left temporal lobe of a woman aged fifty. She had a stroke followed by right hemiplegia and speech disturbances seven weeks before admission to hospital. She had exaggerated tendon-jerks, and Babinski's sign on the right side; slowness and difficulty in pronunciation of words, and answered questions distinctly at first, though with effort, trailing her syllables, but quickly showed fatigue. The syllables overlapped, being sometimes interrupted by words badly articulated or unintelligible. She coined meaningless words (jargonaphasia), and there was paraphasia. She appeared to be word-deaf. Word-blindness could not be tested as she could neither read nor write. Memory feeble. Bad fixation of attention. Only slight hypertension of the spinal fluid, and no evidence of a meningeal reaction. Wassermann negative in blood. Diagnosis leaned toward hemorrhage or thrombosis in the left first temporal convolution with involvement of the internal capsule. There were no signs definitely suggesting intracranial tumor. Death in coma three days later. Necropsy: notable flattening of

the left temporal convolutions, with hemorrhagic foci and an oily lemon-yellow exudation. Microscopical examination showed the presence of a hemorrhagic gliosarcoma of this region. [Leonard J. Kidd.]

Simons, A. GLIOMA IN THE LEFT POSTERIOR HALF OF THE BRAIN. [Ztschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXIX, p. 229.]

The author describes the case of a man, thirty-nine years of age, where the main symptoms were an almost complete bilateral right sided hemianopsia, slight headache and progressive stupor. From the neurological findings a rapidly growing tumor in the deep medullary layer of the posterial half of the left hemisphere was assumed. The constantly increasing deterioration of sight in the preserved field of vision was ascribed to the direct pressure of the tumor on the right occipital lobe or to hydrocephalus. The autopsy revealed, however, that this explanation for the failing of sight was erroneous. A glioma was discovered, which, pressing aside the septum pellucidum from above to the right, grew into the tractus opticus, and at the level of the chiasm, nearly under the third ventricle, broke over from the left into the right side. The chiasm and optic nerve were remarkably broad, thick, and gray. So far as the author knows, this is the first case to be reported of a glioma growing out of the posterior part of a hemisphere into the two optic nerves up to the eyeball. [J.]

Herman, Euphemius. RARE SYMPTOMS OBSERVED IN A CASE OF BRAIN TUMOR. [Zeitschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXVI, p. 293.]

The author describes symptoms observed in a case of tumor at the base of the brain which have hitherto been seldom described and the causes of which are obscure. One of these was hematemesis. The vomiting of blood in brain tumor is a rare symptom but there is no doubt that it has sometimes occurred. Chemical examination in the author's case showed that it was really blood that had been expelled from the stomach and the patient was given a diet from which meat was excluded so that there was no possibility that the blood was due to food taken into the stomach. A review of similar cases in connection with his own leads the author to the conclusion that all hemorrhages of the stomach which result from disease of the central or peripheral nervous system (if there are any of this latter origin) are to be considered of entirely nervous origin. It may be supposed that the small vessels supplying the stomach with blood become overcharged and eventually burst under the strain of vomiting and as a result of the accompanying folding of the mucous lining of the stomach. Another rare symptom was albuminaria. It seems possible that this symptom may have been due to a constitutional tendency, which, while it existed before the tumor, only became apparent in the course of the serious disease. The author regards Brownlow's theory which finds the source of albuminaria in the central nervous system and not in the kidneys themselves as unsupported

by clinical or pathological proof. The absence of blood pressure is another feature of this case which may be considered noteworthy, as many authors find a close connection between the brain tumor, on the one hand, and the heightened pressure of the cerebrospinal fluid and high blood pressure, on the other. Finally the author calls attention to the circumscribed tremors. Epileptiform convulsions of Jacksonian type affected only certain muscles and the convulsions could be produced by bending certain joints or caused to cease by replacing the members in normal position. For these phenomena the author proposes the name of circumscribed muscle tremors, and believes that the symptom may be of use in the diagnosis of tumors. [J.]

Daland, J. CHORDOMA. [Boston Med. and Surg. Journ., 1919, CLXXX, May 22, p. 571 (3 figs).]

The growths called chordomata, described by Virchow by the name *ecchondrosis physalifora*, were shown by Müller and by Ribbert to be formed of the proliferated remains of notochordal tissue. The only normal remnants of the embryonic notochord found in man are the nuclei pulposi in the centers of the intervertebral discs. Notochordal remnants of very small size are often found at necropsies, chiefly at the base of the skull and on the coccyx. They often give no symptoms during life. They are commonest in the sphenoid bone, on the dorsum sellæ, and the pituitary fossa; they are less common on the sacrum. Some of the recently recorded cases of chordoma have been malignant. In Albert's case (1915) trauma seems to have played a direct part in producing the tumor. The cases which occur in the base of the skull often give cranial nerve palsies, from olfactory to hypoglossal; in the sacro-coccygeal cases pressure on the rectum commonly occurs. Jelliffe and Larkins case, not mentioned by Daland, was a malignant one (JOUR. N. & M. DIS., Vol. XXXIX, 1912, p. 1).

Daland's case is the seventeenth recorded case of chordoma. His patient, a woman of thirty, is still living. Three years ago sudden hoarseness, lasting three days. She was then well for a year. Then a severe headache with hoarseness; both symptoms became rapidly worse. Eight months later, during manipulation by an osteopath, she felt something snap in her neck; for twenty-four hours could not turn her head. Two days later a swelling appeared in her right postcervical region. Tinnitus in right ear soon came on; this persisted. She came to Daland for hoarseness and the swelling in her neck. Examination showed affection of the first, second, eighth, eleventh, and twelfth cranial nerves of the right side, with complete paralysis of right vocal cord and papilloedema of left eye. The tumor was curetted at the base of the skull. Headache disappeared; hoarseness persists. She was discharged relieved. Seven months after operation she wrote to say she had no headaches, but that there is a recurrence of the mass in her neck, with some pain. In other respects she is as she was on leaving hospital. [Leonard J. Kidd.]

Morse, M. E. BRAIN TUMORS AS SEEN IN HOSPITALS FOR INSANE.
[Am. Arch. Neur. and Psych., April, 1920.]

Morse has made a study of all cases of brain tumor coming to autopsy during the past ten years in the Massachusetts State hospitals. She finds that brain tumors occur in general and in insane hospitals with about the same frequency. The majority of the patients are admitted to insane hospitals in the late stage of the disease, and the condition is diagnosed, even tentatively, in only about 25 per cent of the cases. The chief reasons for the small proportion of cases diagnosed are that more emphasis is laid on the psychiatric than on the neurologic aspect of the case, that ophthalmoscopic examinations are not made as a routine, and that, since many of the patients are middleaged or elderly, there are frequent complicating factors, especially arteriosclerosis, which obscure the diagnosis.

The average age of patients with brain tumor sent to insane hospitals—fifty years—is greater than the age at which brain tumors usually occur. Frontal tumors predominate, forming 33 per cent of the cases.

In the middleaged patients the most frequent mental symptoms are simple deterioration and apathy. These were most prominent in the frontal tumors, but were present also in those of other areas, with the exception of the temporal growths, in which the symptoms were more active and varied. This tendency to deterioration appears to be especially characteristic of brain tumors in middle age. The development of a brain tumor may be the factor which determines the onset of an independent psychosis in a predisposed person. [Author's abstract.]

Howe, H. S. CEREBRAL GLIOMA AND ACUTE HEMORRHAGIC ENCEPHALOMYELITIS. [Neurological Bulletin, September, 1919, Vol. II, No. 9.]

The case recorded is interesting from a number of standpoints. The antemortem diagnosis was epidemic encephalitis, but at autopsy a hemorrhagic encephalomyelitis and a glioma of the right cerebral hemisphere were found. The existence of the glioma, though it was of large size, had never been suspected and had given neither general symptoms nor focal signs. When the patient presented herself for examination to enter the hospital her complaints were so general and vague and her physical examination so nearly negative, that the admitting physician did not deem it necessary to have her enter the hospital. Her family, past and personal history were entirely negative. Three weeks previous to her admission to the hospital she was found unconscious, rigid and foaming at the mouth. The unconsciousness lasted about an hour but she stayed in bed for a week subsequent to this complaining of weakness and tingling in the left arm and leg and marked drowsiness. The right corner of the mouth was drawn over. After one week in bed she got up and during the next two weeks was up and about but always drowsy, dropping off to sleep very easily. Since the onset of the illness she had had constant headaches not localized in any portion of the head. Any

exertion seemed to increase their severity. There was no nausea or vomiting, no spots or flashes before the eyes, and no evident paralysis, the weakness of the left side having entirely cleared up. During the first three days of her stay in the hospital she was listless and inattentive, answering questions slowly and indefinitely. Her only complaint was a slight headache. After lumbar puncture her condition became rapidly worse, the lethargy becoming stupor and the signs of a left hemiplegia developing. Neurological examination at this time showed a stupid mental state, a left hemiplegia involving face, arm and leg with increased deep reflexes, absent abdominals and a positive Babinski, with catatonic rigidity of the left arm and to a less extent of the left leg. There were no sensory changes that could be determined. Examination of the cranial nerves showed bilateral ptosis, unequal pupils, the left larger than the right, sluggish pupillary reaction to light but normal on accommodation. There were no palsies of any of the globe muscles. The fundi were normal. The paresis of the left side of the face was of the supranuclear type. The condition continued about the same for the next six days, when it suddenly became worse. She grew markedly dyspnoeic and cyanotic, respiration ceasing after a few minutes. During the nine days of observation in the hospital the temperature ranged between 98 and 100, and the pulse 65 to 85. The blood count, urine and stool examinations and blood urea were normal. The blood Wassermann was negative. On spinal puncture the fluid was under much increased pressure but was clear and colorless with a cell count of six lymphocytes, negative globulin, Wassermann and culture.

Autopsy disclosed a large tumor involving the entire central portion of the right cerebral hemisphere. In the tumor was a large hemorrhage involving the external capsule, lenticular nucleus, internal capsule and caudate nucleus. Also near the midportion of the brain there was another large hemorrhagic softened area which was evidently of earlier date. Throughout the brain stem there were many hemorrhages, some large and infiltrating; others apparently confined to the perivascular space of His; and in some areas entirely within the adventitial lymph space (Virchow-Robin space). There were microscopic hemorrhages in the gray matter in the cervical region of the spinal cord and chromatolytic changes in the motor cells of this region. Cultures from the spinal fluid and different portions of the brain were sterile.

Reviewing the case in the light of the autopsy findings, there seemed to be present two distinct conditions: first a slumbering glioma which had given rise to no symptoms until a hemorrhage occurred within its substance. Secondly, an acute hemorrhagic encephalitis. The first hemorrhage occurred within the tumor producing the convulsion and hemiplegia noted at onset. The results of this hemorrhage rapidly cleared up and then other hemorrhages followed giving rise to headache, drowsiness, ptosis, a second hemiplegia and death. Pathologically the diagnosis was cerebral glioma and acute hemorrhagic encephalomyelitis. In the

absence of any general infectious disease, it seemed possible that the hemorrhages both in the tumor and in the brain stem and cord were manifestations of epidemic encephalitis. [Author's abstract.]

Targowla, Rene. DELIRIUM OF INFLUENCE IN TWO CASES OF CEREBRAL TUMOR. [L'Encéphale, 1919, December, Vol. LX-XIV, p. 377.]

The author had opportunity to observe two women who interpreted the troublesome symptoms of brain tumor as evil influences exercised by persons in the environment. On the foundation of the somatic symptoms a more or less consistent delusional system had been constructed. The second patient had a paranoic temperament aggravated by her physical disability. The cerebral tumors had thus determined in predisposed individuals a psychopathic syndrome of interpretation and persecution resembling in its general features presbyophrenic delirium and seeming to constitute a disease picture belonging only to encephalopathies. From a differential diagnostic point of view this syndrome cannot be confused with the well defined psychosis of deliriant interpretation (Seglas, Levy) nor with presenile delirium. General paralysis can also be excluded and above all this delirious interpretation of real symptoms must not be considered as falling in the category of hallucinatory disturbances of consciousness. [J.]

9. NEUROSYPHILIS.

Babonneix, L. EPILEPSY AND HEREDITARY SYPHILIS. [La Médecine, February, 1920, pp. 286-289.]

In this work, written with assistance of Hutinel, David, the author intends to prove that, much more frequently than is generally admitted, the "so called essentielle" epilepsy has only one cause: hereditary syphilis. For proofs, he gives the following data: (1) *Syphilis of the parents or of the grandparents*: suspicious symptoms of the grandmother, or the mother (numerous miscarriages), syphilis of brothers and sister; (2) *suspicious symptoms of the patient himself*: symptoms generally considered as signs of heredo-syphilis; symptoms generally considered as signs of nervous syphilis: no reaction of the pupils to light; inequality of the pupils; (3) *presence of a positive Wassermann test in the blood of the patients or of their parents*, as in the cases of Fraser and Watson; (4) *cure of epilepsy by antisyphilitic treatment*.

From these facts, the author concludes that it is necessary, in a case of "essentielle" epilepsy, to apply the antisyphilitic treatment by using alternatively: iodides, mercury (chiefly intravenous injections of cyanide of mercury) and arsenic. This last is to be administered by one injection of 0.10 centigrammes daily for ten days; then ten injections to be repeated after a fortnight's rest and so till all the symptoms have disappeared. To a sucking baby five drops of hectine daily during a week, to be repeated after a week's rest. The treatment must be begun as soon as possible in as large doses as possible, and continued as long

as will be necessary. It is important to know that at the beginning of the treatment, especially with the hectine treatment, the attacks may, for a time, become more frequent and more severe (Tinel), and the parents must be informed of this possibility before beginning the cure. [Author's abstract.]

v. Rohden, Friederich. PATHOLOGY OF FAMILIES OF PARALYTICS. [Ztschr. f. d. ges. Neurol. u. Psychiat., Vol. XXXVII, p. 110.]

The results here given by the author were from a study of seventy families of paralytics, principally from the lower social strata. The following facts are set forth: In fifty-four of the seventy families at least one of the members showed serological or chemical abnormalities for which the syphilis of the paralytic parent was responsible. In these seventy families sixty-two of the married partners of the individual suffering from paralysis were examined; 70 per cent were pathological, 30 per cent normal. The percentage of births in families of paralytics is low. One fourth of the pregnancies result in miscarriages or still births, and of the living children born a fourth dies in the course of the first years. The average number of children of paralytic parents is 1.7 in each family or nearly one half less than normal, so that these families have a tendency to die out. Of the surviving children about one half are normal and one half pathological. In the families observed by the author about 19 per cent of the children had organic diseases of the central nervous system, over 20 per cent stigmata of psychic degeneration, over 6 per cent a positive Wassermann with negative clinical finding. But beside the syphilitic nervous diseases there were other nervous affections of organic nature, for which no syphilitic etiology in the blood serum could be proved. In many of the children there were nervous anomalies combined with subjective disturbances and general somatic and psychic defects of development. The alterations which were most frequently met with were changes in the bone and cartilage—deformities of the skull, hydrocephalus, scapula scaphoidea, deformities of gums and teeth, etc. The frequency of nervous and psychic defects in these children confirms the statement of Hochsinger that the children of syphilitic parents manifest great susceptibility to nervous diseases; he found that of 208 children, 43 per cent, notwithstanding all precautions in early infancy, succumbed later to nervous diseases, showing that children of syphilitics are nervous subjects from the very beginning. In their great statistical study Junius and Arndt find that 12.5 per cent of the children of paralytics develop mental disease, as headache, convulsions, incontinence of urine, disturbances of speech or pronounced mental disease, as well as abnormalities of character, moral inferiority, or hysteria. In the author's material he found no dementia precox, however. The early states of the paralysis are characterized by the relatively small danger for the infected individual and by great danger for the descendants. A syphilitic threatened with paralysis may communicate the disease

throughout the entire incubation period, and Ehrlich's hypothesis that paralysis is an active infectious process (virulent spirochetes in blood and serum) is constantly receiving confirmation from added experience. [J.]

Bielschowsky, Max. MEDULLARY DEGENERATION OF SPOTS AND SPONGIOSE DEGENERATION IN THE CORTEX OF PARALYTICS. [Journ. f. Psychol. u. Neurol., 1919, Vol. XXV, p. 72.]

The author describes a case of paralysis due to lesions of which the clinical diagnosis presented difficulties. The duration of the disease was eight years. The psychic disturbances were very peculiar. There were no disturbances of speech; the symptoms of the pupils, the numerous epileptic attacks, the left sided spastic hemiplegia suggested a lesion or a softening in consequence of syphilitic endarteritis. An advanced atrophy in the region of the right frontal lobe and the right motor region was found. Microscopically, typically paralytic changes were discovered, namely, degenerative signs in the parenchymatous element and phenomena of infiltration of plasma cells and lymphocytes in the vessel walls. In the atrophic convolutions of the right hemisphere a profound spongiose degeneration was discovered and minute foci were scattered throughout the cortex. The spongiose destruction of cortex made its appearance principally in the shrunken region of the left temporal lobe. The localization was nearly everywhere confined to certain layers—to the deep zone of the third layer and to the border of the medullary layer, with immunity of the fourth and fifth. Beside the spongiose layers there were also smaller spongiose foci which consisted of a honeycombed loosening of the foundation substance and in the vicinity of these places the capillaries were distended with blood. The author endeavors to show that the sponge-like degenerations of the brain cortex as well as the discrete medullary spots arise from an injury of the tissue from serous exudative processes in the vessel apparatus. The author's case offered particular advantages for study because at various places the degeneration had been arrested thus permitting the discovery of every stage of development of the process. The following conclusions are drawn concerning the nature of the pathological changes. When it is found that a capillary hyperemia and alteration of the matrix definitely limited to the region of the lesion and directly referable to a serous saturation with consequent loosening of the tissue belong to the initial phenomena, the local process is by these very facts characterized as an inflammatory one. This view is further confirmed by the proof that at a somewhat later stage the cell infiltration in the vessel walls in the region of the lesion was pronounced. The author is of the opinion that the small foci are part of the same process as the discrete spots on the medullary substance and should be regarded as an expression of a local accentuation of the inflammatory side of the paralytic degeneration. There is no doubt that a relationship exists between the process causing the spots and that to which the destruc-

tion of the cortex is due. In both cases the *primum moriens* is the matrix; but distinctly different accessory factors concur in the histogenesis of the two types, evidenced by the fact that the spots occur almost exclusively in paralysis while the spongiöse destruction of the layers is observed in brain diseases of entirely different etiological and anatomical character. In explanation of the localization of the process in the third and sixth strata, the author mentions that the third layer possesses a special vulnerability. In the sixth layer the considerable difference in density between the cortex and medulla probably reduces the resistance. [J.]

Hoffmann, E. CAN DISEASE OF THE NERVOUS SYSTEM BE AVOIDED BY ENERGETIC EARLY TREATMENT OF SYPHILIS WITH SALVARSAN? [Deutsche Ztschr. f. Nervenhe., Vol. LX, p. 70.]

In the opinion of the author disease of the nervous system may be avoided by early and energetic salvarsan treatment, and with more probability of good result in primary syphilis than in early secondary stages. In the sero-negative primary periods, syphilitic changes of the nervous system have never been discovered and their existence can scarcely be assumed, but even if, at the end of this stage, isolated spirochetes have penetrated into the nervous tissue, they will be more accessible to the salvarsan than later, and if the treatment is sufficiently energetic there will scarcely ever be failure in a complete sterilization. In sero-positive syphilis very energetic treatment and, in cases of long standing, combined treatments, usually produce good results, while in early secondary syphilis all modes of treatment are sometimes ineffective. For this reason every effort should be made to discover the disease as early as possible and combative measures should be immediately resorted to, not only for the protection of the community, but for the protection of the individual against the metaluetic nervous diseases. [J.]

Klessens. GUMMA IN CERVICAL SPINAL CORD. [Nederl. Tijdschr. v. Geneeskunde, 1920, LXIV, p. 525.]

Klessens showed to the Amsterdam Neurological Society a man with a gumma in the upper cervical cord. Onset of severe right occipital neuralgia with cutaneous hyperalgesia of occiput and cheek; months later other signs appeared. In the West Indies his neuralgia was thought to be possibly malarial, for he had negative Wassermann in blood and spinal fluid. At first quinine did good. But after some weeks pain returned, and now he had tingling in left leg, with disturbances of pain- and thermal-sensibility from the anal region to above the fold of the groin, and soon afterwards paresis of right leg. The dissociated sensory disturbances of the left side extended after some weeks to the fourth cervical area, and on the right side there was a slight sensibility-disturbance in the cervico-occipital area. Marked paresis of right arm and leg then appeared in the course of two days, with paralysis of right half of diaphragm. There were also now sensory signs in the second, third, and fourth cervical cutaneous areas. Deep sensibility of right

arm and leg was temporarily lost, and there was transient hyperæsthesia of the right side. For two days micturition needed some straining. Wassermann was now 0.6 positive in blood. Anti-luetic treatment quickly did good. Klessens concludes that the gumma must have pressed on the lateral column of the right second cervical segment of the cord. It has left residual signs, *vis.*, an atrophic palsy of the upper part of the right trapezius, with reaction of degeneration, and disturbances of pain- and temperature-sensibility in the left leg from a handbreadth above the groin-fold to beneath the toes. [Leonard J. Kidd, London, England.]

Westphal, A. STATIONARY TABES. [Deutsche Ztschr. f. Nervenh., Vol. LX, p. 80.]

The author describes a case which furnishes additional evidence that tabes at times has a nonprogressive character and remains stationary at an initial stage of development. In this case the disease lasted twenty-seven years and during this entire period the symptoms were not sufficiently pronounced to permit the diagnosis of tabes to be made with certainty. The patellar and Achilles reflexes were entirely absent on both sides as well as the tendon reflexes in the upper extremities, but beside these symptoms there were no deviations from the normal in the nervous system. The pupillary reflexes were normal, nor was there any fatigability; the patient moved with certainty and celerity and was on his feet all day attending to his business. The "four reactions" were repeatedly tested with the result that the Wassermann in blood and spinal fluid were always negative, as well as the Nonne-Apelt test. Only once the lymphocyte count in the blood reached the suspicious number of 10 in 1 cm. At the section the degenerations of the posterior column characteristic of tabes were discovered. The author's observation shows that great caution should be used in regarding absence of reflexes as a congenital stigma. [J.]

Brodniewicz, Kasimir. PSYCHIC DISTURBANCES IN TABES. [Allg. Zeitschr. f. Psychiatrie, Vol. LXXV, p. 701.]

Because of the frequent combination of tabes with progressive paralysis, and because of the transitional forms between the two diseases there is always an inclination, where there are psychic disturbances in tabes, to suspect that the symptoms belong to paralysis. But in many cases of tabes with psychic symptoms paralysis is improbable, there being no evidences of paralytic processes of degeneration, but on the other hand, symptoms of stationary character or even remissions. The author describes three cases of psychic disturbances in tabes, calling attention to the fact that they are of two types and furnish new illustrations of the two general forms assumed by psychic disturbances in tabes, namely, either that of acute transitory crises, or of a prolonged paranoid condition. The third case cited by the author, which took the form of acute crises, was noteworthy because it did not follow the form of an hallucinatory delirium, but of a confused excited condition. The two

chronic cases also differed from the hallucinatory paranoid type usually described, being a combination of an insane system in which ideas of reference predominated with falsifications of memory. The insane ideas had a uniform and consistent direction, so that the picture suggested the psychosis consisting of an insane system with an exaggerated idea (Wernicke). In both cases the dominating idea was the unfaithfulness and enmity of the wife. Case three (confusional excitement) suggested an intensive injury of the brain by toxin or spirochetes. The pictures in cases one and two which were of paranoid character suggest, on the other hand, an insidious and less powerful brain injury. [J.]

Seelert, Hans. FAMILY EXAMINATIONS IN NEUROSYPHILIS. [Monatsschr. f. Psychiat. u. Neurol., Vol. XLI, No. 6, p. 329.]

Syphilis and especially syphilitic nervous diseases are much more frequent in the families of paretics and tabetics who were infected after marriage or shortly before, than in the families of those in whom the infection took place two or three years before marriage. In the five families examined by the author the father had been infected shortly before marriage. It is to be assumed that in these families the infection of both parents takes place with only a short intervening interval, and the infection of the mother is therefore from a fresh source where the virulence has not yet been reduced by the defense reactions of the organism. These facts indicate that those cases of syphilis are more severe where the infection takes place from an individual who has recently been infected than one who has long suffered from syphilis. [J.]

Pagniez, P. TREATMENT OF GENERAL PARESIS. [Presse Médicale, October 16, 1920. J. A. M. A.]

Pagniez refers to recent attempts in Germany to arrest the progress of general paresis by inoculation with malaria or relapsing fever. He thinks, with the writers, that the percentage of remissions is not high enough to be convincing, but that the way in which the remission occurred seems to indicate something beyond a mere coincidence. Mühlens and Weygandt have had an interval since of only a few months, but in Wagner's case the remission after inoculation with malaria had persisted for three years. Pagniez cites thirty-seven cases in which this treatment has been applied, and mentions also Weichbrodt and Jahnel's experiments on rabbits with induced syphilitic chancres in the scrotum. The chancres retrogressed and subsided completely in a few weeks after the animals had been kept at a temperature of 41° C. for half an hour once or twice a day for several days. The central temperature of the rabbits reached 42° or 44° C. after half an hour in the incubator at 41° C. (105.8° F.). Although this result was not quite constant, yet it is accepted as demonstrating the sterilizing action of high temperatures on the vitality of the spirochetes in experimental syphilis. The deduction seemed clear that in general paresis inoculation of some disease inducing waves of

high temperature might have a beneficial effect. Pagniez remarks in conclusion tertian malaria seems to offer the best prospects for success, but that the patient's tolerance for quinin should be determined beforehand, also that arsphenamin treatment might be pushed at the same time. The German workers are now experimenting in this line, he says.

Laignel-Lavastine. ARSENIC IN GENERAL PARALYSIS. [La Médecine, February, 1920.]

The value to be put upon arsenical preparations in the treatment of general paresis depends mainly on the period of the disease at which it is given, according to Laignel-Lavastine. At an advanced stage, it is not only useless but aggravates the condition. On the other hand, at the onset, and even at the height of the disease, long remissions may be obtained by its use. Remissions, as a rule, are only clinical and are not accompanied by any change in the biological reactions, especially of the Wassermann reaction in the cerebrospinal fluid. The writer recommends that every syphilitic patient should have lumbar puncture performed systematically in the course of the fourth year. If the cerebrospinal fluid shows a meningeal reaction, treatment should be continued till the reaction disappears. If no reaction is present, another examination should be made at the tenth year. Administration of arsenic in the form of novarsenobenzol may be intravenous, intrathecal, intra-arterial, intraventricular or intraorbital or combinations.

Pinard, M. INFLUENCE OF INSUFFICIENT TREATMENT UPON THE APPEARANCE OF MENINGEAL SYPHILIS. [Paris médical, March 6, 1920.]

Marcel Pinard asserts that either insufficient or active antisymphilitic treatment may favor syphilitic involvement of the nervous system. In such cases an active drug has been given in insufficient doses, in unduly brief courses, or with undue intervals between successive courses. The treatment has been active enough to prevent the appearance of skin lesions, but the spirochetes have migrated to the nervous system, where they are less vulnerable. This accounts for the numerous nervous disturbances, deafness, ocular paralyzes, etc., noted during the earlier trials of arsphenamine, especially during the period in which, owing to fear of untoward happenings, the doses were reduced. Nicolau, among fifty-one patients with chancres, found a spinal lymphocytosis in eighteen. When these cases were given twenty injections of 0.02 gram of mercury biniodide, the lymphocytosis, instead of diminishing, nearly always increased. The author observed similar effects in the treatment of nervous syphilis with arsenicals. Often there is aggravation of the clinical manifestations and increase of spinal lymphocytosis after the first series of arsphenamine injections. One of the cases mentioned showed that even an intensive treatment might be insufficient, in spite of the administration of 5.25 grams of neoarsphenamine; the difficulty in this case was that the maximum doses of 0.9 or 1.05 grams were not reached and that the

first series of injections was not followed up by further series. Therapeutic neurotropism may occur alike after mercurial or arsenical treatment. The essential point is that the compounds that are only moderately active, such as the benzoate or biniodide of mercury and mercurial pills are dangerous; likewise, small doses of highly active preparations are dangerous, and single series of treatments or treatments at excessive intervals with the highly active preparations are dangerous. At the onset of syphilis the treatment given should be intensive and the drugs used administered in actually spirochetic doses. After the initial treatment, the period of rest should be short. Treatment should be kept up to the point of disappearance of the clinical, serological and cerebrospinal signs. The least nervous reaction indicates intensive treatment. Intense and continuous treatment of syphilis during the first few weeks of the infection affords some chances of complete cure. On the other hand, faulty management at the outset may, as in one of the cases reported, result in the development of lesions removable only with difficulty, even by prolonged treatment.

Bering, F. SILVER ARSPHENAMIN AND TREATMENT OF SYPHILIS. [Deut. med. Woch., February 19, 1920.]

The author here reports that when the toxic effects of silver arsphenamin are not increased mercury is administered simultaneously. Silver arsphenamin is as valuable as arsphenamin, and the smaller dosage and the smaller arsenic content are advantages. In cases of secondary syphilis treated with silver arsphenamin, 12 gave a negative Wassermann reaction for several months, but in 11 the Wassermann reaction was still positive after six to ten weeks. In 92 cases treatment by mercury and silver arsphenamin combined gave 82 (94.6 per cent.) were negative for eleven months to Wassermann; five were still positive after three to four months.

III. SYMBOLIC NEUROLOGY.

1. PSYCHOLOGY — NEUROSES — PSYCHONEUROSES — PSYCHO-ANALYSIS.

Ferenczi, S. IDEA OF MAKING MISTAKES. [Internat. Zeitsch. f. a. Psychoanalyse, Vol. III, No. 6.]

It often happens that a person looks everywhere for his spectacles while all the time they are on his nose, or seeks his pocketbook only to find it in the place where he ought to have looked for it in the first instance. The author has analyzed several such cases, among others that of a young man who, recovering from a state of intoxication, believed he had thrown his pocketbook into the sea (a deed which, says the author, would have been in accordance with the father fixation of the young man, *i.e.*, "discarding the mother"), but who later found he had placed the pocketbook safely under his pillow. Another case

analyzed was that of a physician who was awakened from sleep to treat a patient and who, after leaving the patient, was overwhelmed with the conviction that he had given the latter a dose of poison (a deed which might well have been an unconscious reaction to anger at having his rest disturbed) and later was relieved to find that he had administered a harmless drug with a name similar to that of the poison.

Behind beliefs of this sort, the author asserts, there seems to lurk a singular tendency to commit certain acts of an aggressive and dangerous sort whose path to motility is carefully barred in the unconscious, though these tendencies still have sufficient force to convince the actor that he has performed them—to deceive his inner perception. Normally it is consciousness which guards the way to motor determinants in the psychic apparatus, but in these cases the unconscious seems to perform this function, preventing the act forbidden by consciousness from being performed under any circumstances whatsoever. This condition recalls that of fantasy in sleep, but in sleep the way to all motor activity is paralyzed. The mechanism by which this false belief in having committed a mistake arises, is the opposite of that in the symptom formation. In the former case the person believes the act has been committed while in reality the motility has been properly censored; in the symptom, on the other hand, the repressed tendency finds its way to motor expression in spite of the censorship of consciousness and unnoticed by it. But both phenomena have one feature in common, namely, they indicate a discrepancy between the two psychic spheres. [J.]

Ferenczi, S. ANALYSIS OF SIMILES. [Internat. Zeitschrift f. aertz. Psychoanalyse, Vol. III, No. 5.]

Attention is here called to the tendency in neurotics to express their thoughts and observations in similes or metaphors, some of which are apt and even witty. He describes the psychic mechanism of these figures of speech as follows: When one sets about making a simile attention is directed solely to the resemblances and similarities, and it becomes a matter of indifference in what object that resemblance is found. It turns out, however, that this "indifferent" material nearly always originates in the repressed unconscious. As is the case with the content of the dream the similes are found to be constructed sometimes from mnemonic traces belonging to the early life of the patient, sometimes from symbolic expressions for unconscious tendencies. The concentration of attention upon the element of resemblance has as result a modification of the vigilance of the censor similar to that in the dream formation. What was previously repressed may find its way to consciousness, though perhaps in a disguised, symbolic form. The neutral attitude toward the material from which the simile is formed may be compared to the indifferent attitude which permits free associations to reveal the unconscious content. Other examples of the same mechanism are the absentminded professor's errors which betray his unconscious thought because his

attention is fixed elsewhere, or symptomatic acts which become more abundant the more the attention is distracted from them. Hypnosis also furnishes an example of the reciprocal relation between concentration of attention and the vigilance of the censor. Silberer has referred to crystal gazing where the attention is fixed on an optical point, in this same connection. Cursing with the use of obscene words illustrates the same mechanism. Attention is centered upon the object of hate and on giving the passion vigorous expression—in what words is a matter of indifference. The deeply repressed and eroticism of the *Œdipus* wish of the angry person finds frank expression in the unguarded moment. Pathological examples also furnish illustrations; the manic in his flight of ideas gives expression to the repressed content; paraphrenics whose state is characterized by indifference to the external world permit their unconscious to pour forth all those secrets which are carefully guarded by neurotics. Psychoanalytic treatment consists in bringing about a certain indifference of attitude in which the unconscious comes to expression.

From these facts it may be inferred that where there is concentration of attention a certain amount of the energy which was otherwise made use of by the censor in holding back the repressed content of the unconscious is consumed in the effort of concentration. This vicarious performance becomes more comprehensible when it is remembered that every sort of concentration of attention is a kind of censoring. The author considers his views on this mechanism only an extension of Freud's theory of wit as a source of aesthetic pleasure. The pleasure in finding resemblances may be compared to the "forepleasure" of wit. The author also notes a narcissistic element in the delight in finding resemblances. That which already belongs to the cherished experience of the ego is preferred and a defense is set up against anything new, hence resemblances to the old are constantly sought in the new objects as they present themselves. [J.]

Griesbach, H. LEFTHANDEDNESS. [Deut. mediz. Wochen., December 18, 1919. J. A. M. A.]

Griesbach states that owing to the fact that in lefthanded persons the speech center is located in the right hemisphere of the brain, instead of in the left as in righthanded persons, the custom of compelling them to write with the right hand, which work is for the most part associated with the speech center, causes them to struggle for years in order to transfer the speech center from the right hemisphere to the left. Lefthanded persons are not originally mentally inferior, as Stier maintains, but it is possible for them to become so through the above described attempt at a readjustment of the speech center. The result of their efforts may be that the speech center is not predominantly located on either side, which Griesbach regards as an unfortunate state of affairs, as it interferes with hemisphere differentiation during the process of its development throughout childhood and adolescence. In adults, a change from the right hand to the left, which sometimes becomes necessary

through accident, is not marked by any central changes, as their unilateral hemisphere differentiation has become definitely fixed.

Ferenczi, S. PATHONEUROSES. [Internat. Zeitsch. f. a. Psychoanalyse, Vol. IV, No. 5.]

In connection with the observation of the case of a young man who, after the removal of one testicle, developed erotomania with sadistic and at times masochistic ideas, and, after the removal of the other testicle, a pronounced homosexuality terminating in paranoia, the author discusses the question whether the sexual attitude at the root of the mental disturbances was brought about by the castration, and answers in the affirmative. He supports his view by citing analogous cases, among them one reported by him some years ago in which the stimulation of the anal erotic zone (by an operation on the large intestine) gave rise to persecutory ideas and finally to paranoia. He states that the original traumatic theory of the neuroses has held its own down to the present time and that Freud's theory of the sexual constitution and its significance for mental disorders, far from contradicting, only complements the traumatic theory. Freud in his article on narcissism states that changes in the sexual life of persons who are physically ill, as, for example, the withdrawal of the libido from the object and its centralization on self, go to show that behind the love for the object of the normal adult there lurks a considerable amount of the early narcissism, which only needs a favorable opportunity to assert itself. Disease, then, or bodily injury, may cause a regression to narcissism resulting in some one of the various forms of neuroses and for such cases the author suggests the name of disease neuroses, or pathoneuroses. In very many cases, he remarks, the libido withdrawn from the external world is not directed toward the entire ego, but merely to a part represented by the injured organ, a condition which may be called a local intensification of the ego. In illustration of this intensification he refers to persons who turn their whole attention to a hollow tooth, for example, really finding pleasure of a genital quality in licking and handling the tooth, "genitalizing" it, as it were. Defining the features peculiar to pathoneuroses the author speaks of a patho-hysteria in contradistinction to Freud's sexual neuroses in which the disturbance of the libido is the primary cause and the organic manifestations, secondary. He finds it more difficult to distinguish the pathoneuroses from Freud's hypochondria, but the main difference is that in the latter there is no visible change in any organ. In the traumatic neuroses there is general psychic and physical shock, but no injury of any particular organ of the body. Injury to the eyes or to any other part of the face is apt to lead to a pathoneurosis, though the face cannot be called an erogenous zone. It is, however, the theatre of one of the most important partial components of the libido, namely, of the exhibitionistic tendency. Injuries to the various erogenous zones, as the anus, genitals, etc., are especially apt to be followed by a pathoneurosis.

While it lies within possibility that an injury to the genitals may result in a hysterical instead of a narcissistic neurosis yet, *ceteris paribus*, the narcissistic reaction, is the usual one.

From these various considerations the author believes there is justification for ascribing to the castration in his present case of paranoia not merely an activating, but a specific etiological causality. In confirmation of this view he refers to the fact that in dementia praecox, in hypochondriac patients, there is frequently complaint of injury to the eyes, face, genitals, etc. It would seem possible that injuries to these parts might, then, have an influence on the feeling of self, that a reciprocal relation might exist between the self and the injury.

Freud emphasizes the fact that the theatre of masochistic activities, however they may later be sublimated and complicated, is always originally the skin of the body. The author believes that the masochistic sensations are established in the manner described by him in reference to the pathoneuroses and that this same process may also furnish an explanation of an obscure feature connected with female development, namely, the problem transformation from the aggressive virile attitude connected with the clitoris to the masochistic passivity connected with the centralization of the libido in the vagina. The condition preliminary to sexual enjoyment in women is an injury—the rupture of the hymen and the forcible distention of the vagina. This injury, productive only of pain, causes an intensification of the libido in the injured parts, just as would have been the case in any other part of the body. While it is true that this progress of the libido from activity to passivity is phylogenetically determined and to a greater or less extent without the trauma; yet Freud's description of that type of women who hate their first conqueror and are able to love their second, seems to indicate conditions in keeping with the author's views. [J.]

Ferenczi. ON PSYCHOANALYTIC TECHNIQUE. [Int. Zeit. f. a. Psa., V, No. 3.]

In this article the author calls attention to the various forms which may be assumed by the resistance to the psychoanalysis and suggests the manner in which such resistance should be combated. The whole procedure, asserts Ferenczi, rests on Freud's fundamental principle that the patient must tell everything that occurs to him. No exception to this rule should be permitted, and, to get at the real content of the unconscious, every motive which the patient has for concealing his thoughts should be analyzed with the greatest care. Patients suffering from compulsion neuroses sometimes communicate only a flow of senseless material. It may even seem that these patients have the direct intention of rendering the analyst ridiculous. To meet situations of this sort attention should be called to the real resistance at the root of the attitude. Patients may then suggest that the physician should aid them by asking methodical questions about the forgotten experiences he seeks to revive—

or that he should put them in a hypnotic state. The author recommends persistence in fixing the attention of the patients on the element of opposition to the treatment and continued insistence that patients give all that occurs to them. The usual result is that significant material is sooner or later discovered. A single admonition, however, is rarely sufficient. Further resistances may take the form of assertions that only syllables, or incoherent words, inarticulate sounds, part of melodies, and the like come to mind. Very intelligent patients sometimes seek to show that the method is absurd by asking what they should do if, instead of thoughts, impulses should occur to them, *e.g.*, to strike the physician. This attitude should be met with the explanation that these questions arise only because of a childish habit of thought belonging to the period when acts cannot yet be distinguished from thoughts. Sometimes actual advances are made to the physician. They should be received in an absolutely passive manner without any attempt to moralize, but always with explanation of the true nature of transference. The resistance of patients to repeating obscene words which occur to them should be overcome by explanations and suggestions. The attitude of the physician should be throughout that of an observer of a process of nature. He should remain entirely passive until a situation arises where intervention is called for.

Ferenczi makes it a rule to meet every demand for information and every question on the part of the patient with a counterquestion. If the patient's question is immediately answered, he loses all further interest and curiosity. If, however, the answer is delayed it is sometimes possible to make inferences as to the unconscious motives of the interrogation from the behavior of the patient. Especially difficult is the situation where patients desire the physician to make decisions for them—for example to help them decide between alternative courses of action. In such cases the physician should always strive to postpone decisions until patients are in condition to choose for themselves. Such requests may in some cases be forms of resistance to the analysis and may be introduced merely to complicate the process. It is possible, however, that during the analysis patients may be confronted by situations where decisions that admit of no delay are necessary. Here the analyst should always adhere to the rôle of "confesseur" and assume as little as possible that of "directeur de conscience." He should lay before the patient all possible moments of the situation, even the unconscious, but without turning the decision into any special direction. It is just in this attitude that psychoanalysis is the diametrical opposite of other sorts of psychotherapy—the "suggestive" as well as the "convincing." When the vital interests of a patient demands an immediate decision it is impossible to place the patient in a condition to make it, the physician is justified in intervening but he should fully realize that when he takes the step of dictating a course of conduct he is no longer acting in the capacity of psychoanalyst, and that his intervention may even impede recovery through reinforcement of the transference. The analyst must at times

undertake an "active therapy" to the extent of overcoming a phobia-like incapacity to make decisions. In such cases he may through persuasion bring about changes in the affective charges, thus gaining access to unconscious material which otherwise he would have had no means of approaching. In case only general answers or observations are elicited from patients the analyst should always insist upon more specific statements. The demand "give an example" should be reiterated until the special facts are discovered. True psychoanalysis has nothing to do with philosophical generalities—it is concerned only with an uninterrupted succession of concrete events.

In conclusion the author discusses the reciprocal (*Gegenuebertragung*). After describing various positions in which the physician may, perhaps unconsciously, become too deeply interested in the patient (of the same or of the opposite sex) he emphasizes the danger of too great anxiety to combat such reciprocal transference. Suggestions are offered as to the line of conduct to be pursued in situations of this nature. The physician may be sure of having due control of the reciprocal transference only when he is able to detect the moment his own feelings in regard to a patient has exceeded the proper measure either in positive or negative sense. Only then can the physician "let himself go" in the manner necessary for psychoanalytic therapy. The method seems to impose on the physician demands which are of directly opposite nature. On the one hand it is necessary that he should give his unconscious associations and phantasies free play; for we know from Freud that it is only when freedom is guaranteed to the unconscious that we are able to grasp intuitively the unconscious expressions of the patient concealed behind the manifest words and gestures. On the other hand, the physician must subject his own unconscious material and that of the patient to the severe test of logic and must be guided exclusively by the results of this test. In time the analyst learns upon certain signs from the unconscious to immediately interrupt his spontaneous abandonment to phantasy and to substitute a critical attitude. This constant oscillation between the free play of phantasy and logical critique presupposes a freedom and unimpaired nimbleness of the psychic emotional charges which is probably not required in any other field. [C. W.]

Ferenczi, S. TECHNICAL DIFFICULTIES IN AN ANALYSIS OF HYSTERIA. [Int. Ztschft. f. a. Psychoanalyse, 1919, V, 1.]

Together with observations on masked onanism and "intellectual equivalents" of onanism.—The experience of the author with one of his patients led him to the discovery of reasons for the failure of psychoanalysis in certain cases of hysteria. The author's patient was a young woman with whom repeated attempts at psychoanalysis had proved unsuccessful, notwithstanding the utmost exertions on the part of the author and the apparent efforts of the patient to cooperate with him. He was able to bring the patient to a certain stage of recovery, but here met with difficulties he could not overcome—he could not make her under-

stand the nature of transference as merely a temporary substitute in the direction of a healthy adjustment, and she continued to make fervid declarations of affection for the physician. The author noticed that when giving way to incessantly repeated phantasies showing her emotional attitude, she invariably assumed the same position on the sofa where she was accustomed to lie during the treatment. She held her limbs crossed in a manner suggesting the posture often taken by women in onanistic practices. The patient was wholly unconscious that she was attaining autoerotic satisfaction by this means, but when the author forbade her lying in this position she was thrown into an almost unbearable physical and psychic restlessness—convincing evidence of the suspicion that she had thus been finding an outlet for sexual emotion. Enlightened by this experience the author further discovered that the patient found other masked means for satisfaction. In the course of her daily employment of housewife and mother she had the habit, for example, of standing in such manner as to obtain a certain sexual gratification. When the author forbade these practices also the patient substituted certain "symptom acts." She developed habits of playfully pressing or pulling various parts of her body, which were obviously onanistic equivalents. The author was successful in making the patient understand the true significance of these symptoms, and by prohibiting all reactions of this nature, all masked onanistic practices, finally brought about a normal sexual adjustment to family life.

The author's experiences in this case led him to make a rule of never losing sight in psychoanalysis of the possibility of unconscious onanistic practices in which the entire sexual activity of the patient may possibly be absorbed. In this way he was able, in various subsequent cases, to overcome obstinate resistances to treatment. Patients sometimes objected, "You tell me that onanism is harmless, yet you forbid it." Ferenczi's response was that masturbation was not prohibited because of its harmlessness generally considered, but because of the hindrances it offers to the psychoanalytic cure, and however harmless the conscious form of onanism, accompanied by libidinous phantasies, may be, the unconscious or masked forms are always to be regarded as of pathological character, a fact which should always be made clear in the psychoanalysis. This can be done in no other way than by enjoining a temporary cessation of such habits, whereby the libidinous stimulus is diverted to a psychic path and thence to consciousness.

Referring generally to onanistic activities Ferenczi states that there are many persons, not neurotic in other respects, who throughout their entire life are engaged in unconscious onanistic activities in which their sexual energies are dissipated. These seemingly harmless habits may lead to anxiety neuroses; a termination of symptomatic acts which are disguised masturbation equivalents is not infrequently a form of compulsive tics. Of these latter affections no psychoanalytic explanation, says the author, has hitherto been brought forward.

Ferenczi, in conclusion, calls attention to the fact that in the case here described, he abandoned the passive attitude usually recommended for the analyst, and that, instead of merely listening to the ideas and interpretations of the patient he took an active part in her efforts, imposing certain restrictions and enjoining a certain course of conduct. For this he finds a precedent in the "active technique" of Freud whose method it is in anxiety cases, not merely to bring the critical situation to light, but to devise ways of abandoning the pathological position anchored on false foundations. Ferenczi compares his method in the case cited with the process followed in physiological experiments where blood pressure is increased in certain areas by placing arterial inhibitions at a distance therefrom. By a similar increase of energy through prohibition of its dissipation in libidinally charged acts the resistance of the censor is overcome and a normal adjustment is attained. "Experimental psychology" of this sort is well adapted to test the value of the Freudian theories, he asserts, indicating a way of measuring psychic quantities, in analogy to the manner in which other energies are measured. [J.]

Abraham, K. RESISTANCE IN PSYCHOANALYSIS. [Int. Zeit. f. a. Psa., V, No. 3.]

Abraham here refers to a difficulty encountered in psychoanalysis which has not hitherto received attention in the literature on the subject. In place of forming free associations as directed, patients sometimes give a product of reasoned thought or insist that no thoughts at all occur to them, with the result that the period of treatment may pass without the physician's being able to bring to light any of the deeper associations. This behavior is the result of resistance. Patients of this sort strive to prevent the psychic content from becoming conscious by substituting other material for that which is unconscious. They deliver a connected oration and are impatient if the flow of language is interrupted. The physician who is not acquainted with this special form of resistance makes the mistake of thinking that these patients are showing indefatigable willingness to be analyzed, never suspecting that real opposition is disguised under this apparent complaisance. In neurotics of this type certain symptoms recur with astonishing regularity, showing the original pattern of the obstinacy to be the attitude of the child toward the father—an attitude which involves extreme self-assertiveness and an unconscious sensitiveness to any situation which threatens to reduce the feeling of egoistic satisfaction. This infantile tendency leads patients to regard both the analyst and the treatment from the point of view of the acquisition of pleasure, and the real purpose of the therapy, *i.e.*, the cure, is neglected. There is absence of transference to the physician, these patients being averse to having the physician assume the rôle of the father substitute; if the transference begins to take place, they make exorbitant demands which are beyond the power of the physician to grant and exact constant signs of personal interest. But usually in place of

the transference there is an inclination on the part of the patients to identify themselves with the physician, to take the physician's place, just as do children when, in phantasy, they play "father." Such patients attempt to instruct the physician, giving their own views on their disorders as though their opinions have extraordinary value. In this "auto-analysis" they wish to do everything themselves without the physician's aid, in analogy with the process of onanism, or of the onanistic equivalent, the neurotic day-dream. The most pronounced cases of this sort observed by the author belonged to the category of compulsory neurosis. As might be expected, there were strongly marked sadistic and anal traits in all these instances. The fact that these patients willingly gave out money in remuneration for the psychoanalytic treatment seems to stand in contradiction to the known miserliness of anal erotics, but this discrepancy is explained when it is remembered that it is to their own narcissism that they are yielding the outlay. For all these cases Abraham considers an exhaustive analysis of the narcissism in its various expressions and especially in regard to the father complex, as extremely necessary. In none of his cases was he able to make a complete cure. [J.]

Freud, S. A CHILD IS BEING BEATEN. [Int. Ztsch. f. a. Psychoanalyse, V, No. 3.] *

The phantasy that a child is being beaten is encountered with astonishing frequency in persons who, suffering from hysteria or compulsion neuroses, seek psychoanalytic treatment. Because the phantasy is connected with autoerotic gratification and contains sadistic and masochistic elements of great importance for the later development of character, the author, in a series of six cases (four female and two male) inquired very carefully into its foundation. His analysis was confined for the most part to the female cases, first because they were the more numerous and secondly because certain peculiar factors entered into the phantasy in males which he proposed to make the material of a separate study. Though he was unable to arrive at clearness in regard to many points of the phantasy he gathered together a certain amount of information valuable for the interpretation, in the form of discovery of sex of the person administering the beating, the sex of the persons beaten, the presence of the sadistic and masochistic elements.

In little girls this phantasy passes through three phases, of which the first and last are consciously remembered, while the middle phase remains unconscious. The first phase may be expressed in the sentence "my father is beating a child," further to be interpreted "my father is beating a child whom I hate." This phase may not be a phantasy at all, but an emotional interpretation of a scene really witnessed. It is doubtful also whether this phase can be called either masochistic or sadistic; it is perhaps the first manifestation of the material out of which later these

* Translated in full in the International Journal of Psycho-Analysis, Vol. I, Part 4.

perversions develop. The second phase is the most important in significance and consequences, but the exact sense in which existence is to be attributed to it is not clear. It is not remembered and it has never been conscious. It is really constructed out of the analysis but there is, nevertheless, convincing evidence that it originated in some form in the individual's experience. In this middle phase the girl herself receives the beating from the father. In the third phase it is usually small boys who are beaten by the father and the phantasy has acquired strong sexual emphasis, serving to bring about onanistic gratification, and, unlike the second phase, it is strongly sadistic. In all the phases it is the father who administers the beating; the unconscious phantasy of the middle phase is developed by repression and regression, from the incestuous desire to be loved by the father and is masochistic. In the third (sadistic) phase, it is noteworthy that the sex of the person receiving the beating is changed. The problem is: how does this sadistic phantasy that unknown boys are being beaten become the final form of the libidinous strivings of the girl? The author expected to find in boys a complete parallel to this phantasy in girls, but to his surprise discovered very important differences. The boy's phantasy of being beaten is passive from the beginning and really constitutes a feminine attitude toward the father and the element of homosexuality is thus introduced. The author makes use of the facts discovered in this study to test two theories which sexualize the process of repression. One of these theories is based on the bisexual constitution of human beings and asserts that the cause of repression is the struggle between the two sexual characters which every one possesses, the dominating sex tending to repress into the unconscious the mental representative of the subordinate one. Therefore the element repressed is that which, in the person, belongs to the opposite sex, *e.g.*, in a man what is unconscious can be traced to the activity of the feminine impulses and vice versa. The other theory is Adler's "masculine protest," according to which every individual is constantly striving to attain a masculine or superior line of development. The force which represses would then, on this supposition, be the masculine impulse; the element forced back would be the feminine one. Neither of these theories offers any explanation of the phantasy that a child is being beaten. In the light of what is here disclosed it is impossible to assume a relation between the manifest sexual character and the choice of what is destined for repression. It is seen that in both male and female individuals an activity of masculine as well as of feminine impulses is recognizable and both impulses can become unconscious without reference to the manifest sexual character. For example, in the boy the feminine line of development is not given up and he is never "above" in his masochistic phantasy. Psychoanalysis, says Freud, maintains the view that here the motive force of repression cannot be sexual. The material constituting the unconscious is composed of archaic phantasies, and that which is repressed is that which has to be left behind in the later phases of develop-

ment because it is no longer useful. This repression succeeds better with some groups of tendencies than with others. Sexual cravings, because of certain conditions which have frequently been referred to, are able to elude the repressive force and prolong their existence in disguised but disturbing forms. For this reason the repressed infantile sexuality becomes the main impulsive force in the formation of symptoms, and the essential part of the content of the unconscious, the Œdipus complex, becomes the nuclear complex of the neuroses. [J.]

2. PSYCHOSES.

Masoin, P. THE DIAZO REACTION IN EPILEPSY. [Bull. de l'Acad. Roy. de Méd. de Belgique, July, 1919.]

P. Masoin has studied the diazo reaction of the urine in epilepsy. This reaction was not obtained in normal subjects. He concludes that the absence of a diazo reaction in epilepsy justifies a favorable prognosis; its presence implies a fatal prognosis in two thirds of the cases, and is regarded as evidence of a state of metabolic derangement and autointoxication.

Brunton, G. L. CYTOLOGY OF THE CEREBROSPINAL FLUID IN MENTAL DISEASE. [Journ. Mental Science, October, 1919.]

G. L. Brunton emphasizes the importance of an examination of the cerebrospinal fluid in mental diseases and sees in it a valuable aid to diagnosis. In his hands such examination gave positive results not only in general paralysis, but in various other conditions, including mania, melancholia, epileptic insanity, delusional insanity, dementia praecox, and ordinary dementia. He regards Alzheimer's method as the best for the cytological examination of the cerebrospinal fluid; cells can be differentiated in a way not hitherto possible and a fair quantitative count can be made. The cells of the greatest diagnostic importance are the plasma cell, the phagocytic and the endothelial cell and the lymphocyte in excess. A high cell count with an excess of lymphocytes, together with the presence of plasma cells, is strong evidence of parasymphilitic lesion. To avert the after effects of lumbar puncture rest in bed is desirable.

Rossi, S. C. PSYCHOSES FOLLOWING INFLUENZA. [Anal. de la Facultad di Med., December, 1919.]

S. C. Rossi records nine cases of manic-depressive psychosis in patients aged from eighteen to forty-five, which developed during the period of asthenia characteristic of convalescence from influenza. He attributes the psychosis to suprarenal insufficiency (produced by influenza), on the following grounds: (1) Other observers have noted manic-depressive psychoses following influenza. (2) It is well known that influenza affects the suprarenals, and that adrenalin in small doses is one of the means of treating the infection. (3) Other patients with the manic-depressive psychosis under Rossi's care showed signs of suprarenal insufficiency without having had influenza.

Anderson. MENTAL DEFECTIVES IN A SOUTHERN STATE. [Mental Hygiene, October, 1919.]

Anderson gives a report of the Georgia Commission on Feeble-mindedness and the survey of the National Committee for Mental Hygiene. As a result of this survey he says that 40 per cent of the inmates of the almshouses were feeble-minded. Feeble-minded families had been found in the state that had been supported by church and organized charities for three or four generations. A study of a typical orphanage showed that 28.7 per cent of the children were feeble-minded. If the same percentage exists in the other orphanages in the state, there are at least 810 feeble-minded in orphanages who need special care and training in a school for the feeble-minded. At the state prison farm 17.5 per cent of the inmates were feeble-minded. The striking fact at this institution was not so much the presence of feeble-minded men, but the great number of other forms of mental abnormality, mental disease and deterioration, epilepsy and the like. In this institution 65.8 per cent of the inmates were classifiable in terms of deviation from normal mental health. Of the women inmates of the prison 42.8 per cent were found to be feeble-minded. In the two typical county jails studied 34 per cent of the inmates were feeble-minded, with a mental level of ten years or under. Of 122 immoral women examined 43.5 per cent were found to be feeble-minded. The present policy of treating these feeble-minded girls for venereal disease and then turning them into the community to acquire it over again is costly. Probably the greatest factor in the spread of venereal disease is the feeble-minded prostitute. Of 100 cases of juvenile delinquents studied in the juvenile courts, 17 per cent were found to be feeble-minded. In one reformatory for boys, 15 per cent were feeble-minded. In the State Reformatory for boys 24.1 per cent were feeble-minded and in the State Training School for Girls 27 per cent of the inmates were feeble-minded. These feeble-minded delinquent children later become the chronic habitués of the jails, courts and prisons. In the public schools 3.5 per cent of the children examined were feeble-minded.

Wideröe, Sofus. PATHOLOGICO-ANATOMICAL FOUNDATION FOR SHOCK FROM EXPLOSIONS. [Archiv f. Psychiat., 1919, Vol. LIX, p. 110.]

The author does not discuss in this article those results of explosions which produce wounds or rending of tissue by fragments of shell. The cases here referred to are of contusion or shock. Contusions from pressure would be a better expression for these disturbances than shell shock, in the author's opinion, because it is really the atmospheric pressure that produces the effect on the nervous system. From his very first experiences the author was of the opinion that the special symptom picture after shock from explosions which is characterized by prolonged stupor is accompanied by pathological changes in the brain. He believes that the pressure produces lesions which are perhaps so subtle in nature that they can not be perceived by the gross methods of investigation at the

disposal of neurologists, and he disagrees with those writers who regard all cases of shock from explosion as simply traumatic neuroses and disturbances of merely functional nature. The peculiar type which he describes has received little attention in the literature and he thinks these cases where the apathetic stupor plays the principal rôle in the disease picture can only be explained as the result of cerebral injury. He distinguishes between the condition to which he has reference and *contusio capitis* or *commotio cerebri*, and gives cases which fell under his observation to illustrate his views. His assumption in regard to the foundation for the symptoms in these cases is in keeping with experiments made as to effects of explosives on animals, but the author disagrees with Ravaut's opinion that the hemorrhages are due to the bursting of vessels. He thinks they are more probably of internal diffuse capillary character. If the whole organism were suddenly subjected to a very high pressure, for example of 1,000 atmospheres, the pressure from the exploding shell, the venous circulation would be extensively affected. The result would be a heightening of the pressure in the capillaries; these delicate structures would give way, the result of which would be capillary hemorrhage. Thus explained it would be easy to understand that where the contusion was not sufficiently severe to produce death, the effects would first become apparent in the brain because the brain is the most delicate organ and the one in which the capillaries are the most abundant. [J.]

Stoeltzner, W. ETIOLOGY OF MONGOLIAN IDIOCY. [Münch. medicin. Wochens, 1919. J. A. M. A.]

Stoeltzner found that in three of ten cases of mongolism the mothers during pregnancy had presented constipation, little appetite for food, striking tendency to take on fat in spite of moderate quantity of food eaten, falling out of hair, hypohidrosis, chilliness, great languor, increased need of rest and sleep, apathy and decrease of mental activity—a clear picture of hypothyroidism. Whether there is a causal connection between this syndrome and mongolism Stoeltzner is not prepared to state, but the definite proof of such a causal relation would open the way for active prophylaxis. His findings sustain Lanz' conclusions from his experimental research on the offspring of thyroidectomized animals (1905).

Mendel, Kurt. TRANSESTITISM AND HOMOSEXUALITY. [Neurol. Centralbl., January 2, 1919, No. 1, Vol. XXXVIII.]

The author describes three cases in which he was called to offer an expert opinion concerning the mental condition of soldiers with homosexual tendencies. All three cases presented essentially the same symptoms: desire to wear women's clothes, to follow occupations usually considered to belong to women—dressmaking, salesman of women's wares, "soprano" singer in cabarets. All possessed outfits of women's clothes in which they attended balls, cafés, etc., and they even took these costumes to the military barracks with them. All expressed deepest distress at having been drafted and they entered into homosexual relations

with their companions. The author was of the opinion that individuals with tendencies of this sort are unfitted for military life, not because of their homosexual tendencies, for there are many homosexual individuals who follow a military life without harm to themselves or others, but because homosexuality with transvestitism and pathological constitution, as in these cases, are characteristics which preclude adaptation to military service. Another case described by the author was that of a lieutenant who showed homosexuality only when under the influence of alcohol. The author's opinion was that in view of the fact that the patient had inherited neuropathic tendencies exaggerated by the conditions of military life, he had a hermaphroditic mental tendency and under the influence of alcohol the latent homosexual component of this pathological tendency asserts itself. There was, therefore, a well-founded doubt whether the patient was accountable for the homosexual advances of which he was accused.

Jacob, A. PSYCHOSES FROM COMMOTION. [*Zeitsch. f. d. ges. Neur. u. Psych.*, 1919, Vol. XLV, p. 30.]

The author communicates two typical cases of psychoses from commotion and follows with a third case which deviated in many features from the usual picture. The patient had received a relatively insignificant head trauma with only slight concussion of the brain. Contrary to that which usually happens in similar cases the psychological disturbance did not set in until twelve hours later. Then for a short time the disease ran a course corresponding to the usual disease picture after commotion, but this period was followed by an interval of confusion lasting several months. There was disorientation, severe disturbance of judgment, confabulation, etc., and only very gradual restoration to psychic health. There was, however, a permanent hiatus in memory for the entire period of the psychosis, but no retrograde amnesia for the time before the accident nor for the accident itself. That such a comparatively slight concussion of the brain should condition such a serious mental picture was very unusual. All the clinical symptoms which are to be interpreted as a general weakness of the brain clearly indicate a severe diffuse injury by the concussion. It is known that commotion regularly causes diffuse changes in the central nervous system, both in cortex and basal ganglia, and this fact must not be lost sight of in accounting for post-commotional conditions. [J.]

Morgenthaler, W. CONCERNING DRAWINGS FROM VISUAL HALLUCINATIONS. [*Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLV, p. 19.]

The author describes three cases with hallucinations, seeking to show that by having the patients delineate their visions new light is thrown on the problem of visual hallucinations. He arrives at the conclusions that the main factor in the production of hallucinations is a central affection, either a stimulation of the sense centers or of some other central area.

The visual hallucinations *may* be incited by peripheral influences, or perhaps *must* be induced by this means. This peripheral factor may be a fullness of blood in the eyes, vessel contractions, a mechanical influence, disturbances of metabolism in the retina, etc. As is revealed in the drawings from the visions, the phenomena incited from the periphery may be distinct in outline and may be accepted by patient without explanation (Case 3). Cases of this sort are the least numerous. Again in a few cases the hallucinations are definitely perceived and are illuminated by subsequent explanation (Case 2). In the majority of cases, however, the visions are indistinctly perceived and with the optic phenomena induced from the periphery the wishes, hopes, and fears of the patient are inseparably confused (Case 3). These emotional elements attract the attention to such a degree that, from a superficial view, the peripheral factors may be entirely lost sight of. There is no proof that there are visual hallucinations entirely without peripheral factors. In regard to these visual phenomena the following problems should be more carefully studied; their relation to the optical phenomena of normal persons, to after images and to scotomata. [J.]

Jacobsohn, L. MORAL FEELINGS OF AN ADOLESCENT. [Zeitschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVI, p. 131.]

Though there are various methods for testing intelligence, there is no method, at least in Germany, for measuring the moral feelings of adolescents. Ziehen's moral tests are really only for children and are received with a sarcastic smile by subjects of riper years because of the simplicity of the ideas presented. Following the suggestions of Levy-Suhl and Fernald the author has devised the following method: Adolescent delinquents of from twelve to eighteen years of age are given seven separate pages on which are described their own transgression and six others committed by adolescents, for example: (1) Their own misdeed. (2) Stealing cakes. (3) Stealing postage (fifty pfennigs) from a package to be mailed. (4) Stealing a bicycle; forgery and embezzlement. (5) Playing with weapons with fatal result. (6) Inflicting severe head injury and committing robbery. (7) Killing of stepfather in sudden anger. These seven misdeeds are to be carefully examined by the person to be tested and then arranged in the order of their gravity according to his judgment. The results in sixteen cases with youths who had committed various crimes is given. The opinion concerning the moral feeling is to be rendered not so much according to the place in the series to which the crimes are assigned as according to the reasons given for placing them in certain relative positions. If the series is so arranged that grave transgressions are found to be regarded as light; that judgments are formed according to superficial aspects; that the motive impelling the deeds is lost to view; that the cunning used in carrying out the deed is not taken into account; or where the transgressor's own delinquency, perhaps a grave crime, is estimated as insignificant, it may be assumed

that the individual is a morally inferior individual. Whether this method is adapted to reveal the ripeness which the moral character has attained cannot as yet be determined. It will first be necessary to institute tests with a number of normal persons and thus obtain standards of comparison. Though this method does not go into detail as thoroughly as Ziehen's intelligence tests it is nevertheless a good method for gaining an insight into the mental as well as into the moral development of the individual. [J.]

van der Hoeve, J. TUBEROSE CEREBRAL SCLEROSIS WITH INTRAOCULAR TUMORS. [Nederl. Tijdschr. voor Geneeskunde, 1920, LXIV, September 25, p. 1263.]

The writer reports to the Dutch Ophthalmological Society a case of tuberose cerebral sclerosis showing intraocular tumors. In this disease there are gray, sclerotic, bulbous patches in the cerebral convolutions, true tumors in the cerebral ventricles, cerebral cysts, and many kinds of tumors, *e.g.*, hypernephromata, myomata, angeiomata, fibromata, lipomata, sarcomata, renal cysts, cardiac rhabdomyomata, thyroid adenomata, and many kinds of cutaneous tumors, such as adenoma sebaceum, naevoids, etc. The disease may be regarded as an embryonic abnormality with tumor-formation in many organs. Its symptoms usually appear in childhood, sometimes after puberty. There is arrest of intellectual development, loss of acquired knowledge, and idiocy, with epileptic attacks indistinguishable from genuine epilepsy. In the case reported, van der Hoeve found a tumor on the right optic disc, and slightly raised tumors in both retinae. By the ophthalmoscope the retinal tumors give the impression of benignant glia-proliferations, such as occur in von Hippel's disease; the writer brings them into line with the cerebral cortical tumors, and the papilla tumor with the cerebral ventricular tumors. The tumor on the optic disc showed evidence of cystic degeneration. In five idiotic children suffering from tuberose sclerosis the writer found retinal tumors in all the eyes, but in only one eye a tumor of the optic disc. (In the discussion, Mulock Houwer mentioned a case of papilla tumor, a perithelioma, recorded by Schieck.) [Leonard J. Kidd, London, England.]

White, W. A. CHILDHOOD THE PERIOD FOR MENTAL HYGIENE. [Mental Hygiene, April, 1920.]

One of the most important issues in mental hygiene is to correlate the sick adult with the knowledge we have that his illness is traceable in its beginnings to his early life. This must be done by a more developed knowledge of the psychology of childhood, which is reflected in the home, in the school, and in the principles and methods of education. Efforts to improve the environment, even with reference to such obvious features as food, clothes, and ordinary sanitation, are not lacking in their general effect upon the mind of the developing child. Recent observations in the devastated countries of Europe have shown how quickly destitution, which takes all the joy out of life, is reflected in the mental makeup of the chil-

dren. Such problems as the care of the pregnant woman, child labor, sex education, school sanitation, and more specifically the problems of the atypical child and juvenile delinquency, all can be better dealt with in proportion to our increased knowledge of child psychology. Social problems have a direct bearing. Inasmuch as many of the breaks, perhaps most of them, occur in the adolescent or early adult period, it would be of inestimable value if help could be systematically extended to the youth when the symptoms of final disaster are likely to be discoverable.

Raeder, Oscar J. ENDOCRINE IMBALANCE IN THE FEEBLEMINDED. [Jl. Am. Med. Ass., August 21, 1920.]

Evidence of gland changes observed in one hundred cases of feeble-mindedness, by routine examination methods, clinical and postmortem, without particular reference to endocrinology, is constant and striking. Seventy-five per cent of cases showed changes of one sort or another, and marked gland changes occurred in 21 per cent. Mongolian idiocy, with the constant and characteristic bony and soft tissue changes, microsomia, lowered resistance to infection, poor circulation, loose jointedness, and changes in the endocrine glands, seems evidently to have some connection with endocrine pathology. The influence of the internal secretions is far reaching, beginning early in life. In order to avoid permanent changes such as infantilism, dwarfism, acromegaly, microcephaly and feeble-mindedness it is imperative that the evidences of dysfunction be recognized and remedied by supplying the deficient hormone, or inhibiting the hyperfunction of a gland early in the course of its malfunctioning. The finer pathology of the ductless glands having to do with biochemical reactions, opens an unlimited field for research on feeble-mindedness by physiochemical and roentgenologic investigation. [Stragnell.]

Nieuwenhuijse, P. TUBEROSE SCLEROSIS. [Nederl. Tijdschr. voor Geneeskunde, 1920, March 20, p. 999.]

Nieuwenhuijse recently showed to the Amsterdam Neurological Society specimens of tuberose sclerosis. In this condition we find in the brain abnormalities which stand halfway between developmental disturbances and neoplasms. In addition to the foci in the brain, we find regularly in these patients sebaceous adenomata in the skin, renal fibrolipomata, and in some cases cardiac rhabdomyomas. In the brain one is struck by the occurrence of extraordinarily large cells that must be conceived of partly as ganglion cells and partly as glia cells. In sections they are sometimes visible to the naked eye. One frequently finds large glia cells, but similar large ganglion cells do not occur in other morbid processes; they show many peculiarities, and can perhaps serve as a signpost in the search for the nature of the developmental disturbance. Bielschowsky thought these large cells might be due to a kind of vicarious hypertrophy—that the proliferating glia had destroyed various nerve cells, and that those which escaped became overgrown. This theory is unacceptable to the writer, and it is now admitted by Bielschowsky that

large ganglion cells can occur without any connection with a glial proliferation; the large cells and the glial proliferation might both be the sequel of the developmental disturbance. Attempts have been vainly made to seek a relation between tuberosc sclerosis and other affections of the central nervous system, such as neurofibromatosis, pseudosclerosis, some forms of genuine epilepsy, gliomas, and some hypertrophic forms of idiocy. From a study of all the known cases, and also his own, the writer has the impression that tuberosc sclerosis is a more or less independent disease. While it has certain abnormalities in common with other diseases, we must not pay exclusive attention to them, but also to its characteristic differences. The writer mentions the odd fact that in one of his cases he found ganglion cells in the cerebral pia matter; at first he regarded them as artefacts, but thought he could exclude this possibility. [Leonard J. Kidd, London, England.]

Kjerrulf, H. MENTALLY BACKWARD CHILDREN. [Hygeia, August 16, 1920. J. A. M. A.]

Kjerrulf compares the data from 1893 children in a regular school with those from 365 in a school for the mentally backward. There was a history of premature birth in 6.2 per cent of the former and in 16.2 per cent in the latter group; there were 137 first born and 3.4 per cent twins among the mentally backward; undescended testicles in 5.6 per cent of the 215 boys, but the thyroid was of normal size in all but 0.54 per cent of the mentally backward while it was distinctly enlarged in 4.7 per cent of the children in the regular school. Ylppö has recently published a protest against classifying cases as congenital debility when in fact premature birth or hemorrhage from birth injury or both are responsible for the abnormal condition. He accepts a weight of 2500 gm. as the limit below which the birth should be regarded as premature, but Kjerrulf thinks a length of 47 cm. is a better criterion.

Starck. AMAUROTIC FAMILY IDIOCY. [Mon. f. Kinderheilkunde, May, 1920.]

A typical case of amaurotic family idiocy is here reported. There was no history of Jewish ancestry. The first child and the fourth child—both girls—had died from the disease at twelve months. Two boys were free. A remaining girl was a year old when seen, and the indications then were that it could not live long. The disease developed in a very similar manner in all these girls. Sex incidence is not otherwise recorded. The parents were healthy and well to do.

Bernstein, C. COLONY AND EXTRA-INSTITUTIONAL CARE FOR THE FEEBLEMINDED. [Mental Hygiene, January, 1920, p. 1.]

Bernstein in an illustrated article showing pictures of boys and girls and their colony homes and giving in much detail plans, experience and results in the work of rehabilitating defectives and dependents and reëstablishing them as economically useful, is convinced that much may

be accomplished by applying the methods of modern commercial practice to what has popularly been pronounced the human scrap heap, the waste product of modern civilization, and that it is possible to salvage therefrom a useful byproduct, and herein is again demonstrated the possibility of redeeming or rendering useful through the application of scientific methods, materials and energy formerly considered as burdensome waste.

It is here shown that a very considerable proportion of the feeble-minded may be rendered self-sustaining, as well as much happier and more normally human, through methods of manual and industrial training, and thus rendered competent to lead lives of usefulness within selected and supervised environments suited to their mental limitations wherein they can contribute to the comfort and happiness of the world as well as to their own pleasure and contentment in rendering assistance in agricultural and domestic science, two lines of work in which there is great need with unanswered demand.

The article further shows the large possibilities in the use of such labor in conservation processes, such as clearing and draining waste lands, reforestation, road building, etc.—really a twin conservation—for unless the energy of these people is thus directed and diverted from abnormal channels the cost for their care as well as their human degradation is greatly multiplied.

This work has also proven a very practical eugenic measure, for many cases thus controlled and withheld from delinquency and reproduction would never submit to confinement for long periods in custodial institutions. [Author's abstract.]

Vianna, A. HISTOPATHOLOGY OF SENILE DEMENTIA. [Brazil-Medico, September 18, 1920.]

The author traces the progressive changes that he found in the evolution of the histological picture seen in senile dementia. It advances from the neurofibrillar changes (Alzheimer) in the hippocampal region to patches (Redlich-Fischer) in the cortex. Then patches develop in the cornu Ammonis, and finally neurofibrillar changes in the cortex takes place.

Mundie, G. S. THE PROBLEM OF THE MENTALLY DEFECTIVE IN THE PROVINCE OF QUEBEC. [Canad. Jl. Ment. Hyg., July, 1920.]

For centuries the world has been faced with the problem of what to do with those persons who are born into the world with a mentality below that of the average human being. The pendulum in the treatment of this problem, like all social questions, has swung first one way and then back the other. Heredity and environment have had their exponents as the cause of feeble-mindedness and much time has been wasted in trying to solve the problem by fruitless discussion over these two subjects. Crime, prostitution, illegitimacy and immorality have all been questions which have worried every person who is public spirited enough to want the community in which he lives to be better mentally as well as physically.

Very little attempt was made to solve these questions from a scientific standpoint until a few years ago. Within the last ten years, largely through the work of the United States National Committee for Mental Hygiene, an attempt has been made to try and stop the ever-increasing number of feeble-minded persons in the United States. The question has been attacked from all sides, by educational methods, by the formation of clinics to study these persons sent by the juvenile and other courts, and by the building of splendid institutions where they can be segregated and taught to live useful and happy lives. To-day there are eleven states which have separate institutions for the feeble-minded and epileptic. Nineteen states have institutions where the feeble-minded and epileptic are looked after together. In Canada it is only within the last few years that any particular interest has been shown in the immense problem of the mentally defective. Probably the first organized attempt to tackle and solve this problem was undertaken by the National Council of Women. They, through the gathering of statistics in other countries and also in a limited way in Canada, have tried to have legislation passed both by the federal and provincial governments which would take care of the feeble-minded. In the Province of Ontario valuable work has been accomplished through the Psychiatric Clinic at the Toronto General Hospital, where, between April, 1914, and September, 1918, 4347 cases had been examined. Of these persons 50 per cent were mentally defective, or including the so-called backward, who in nearly all cases are feeble-minded, almost 60 per cent, while the insane number more than 14 per cent.

The Province of Manitoba has probably taken the most forward step of any of the provinces in Canada. In 1918, at the request of the government, the Canadian National Committee for Mental Hygiene made a thorough survey of conditions in Manitoba, particularly in reference to hospitals for the insane and other institutions where mental defectives were housed. The government has approved of all the recommendations submitted by the committee, with the result that the Province of Manitoba will soon have a system for caring for the mentally abnormal second to none.

In the Province of Quebec a number of isolated efforts have been made to find out how great was the problem of the mentally defective. In 1914 the writer examined all the boys at the Shawbridge Boys' Farm where practically all the inmates were sent by the Juvenile Court for various types of delinquency. Eighty-seven children were examined; forty-two, or 48.27 per cent, were mentally defective; twenty were normal, and in three cases the examination was unsatisfactory owing to the nervousness of the children. A large proportion of these boys were children of immigrants and if the Canadian immigration laws had been more strict, it would not have been necessary now to deal with their defective and delinquent children. In 1917 and 1918 the writer examined 113 wives of soldiers referred to him by the Canadian Patriotic Fund, Montreal. All these women were examined mentally and in the majority

of cases a Wassermann test was taken of their blood. Thirty women, or 26.56 per cent, were mentally defective; seventeen, or 15.04 per cent gave a positive Wassermann test on their blood; one was mentally normal but a moral degenerate; three were chronic alcoholics; one was insane and three were epileptics. A mental examination made of all the girls at the Girls' Cottage Industrial School, St. Lambert, revealed the fact that all these girls were feeble-minded. These girls were all delinquents, having been sent there by the Juvenile Court and other agencies. The survey made of the children in several institutions in Montreal in 1919 by Miss Cole, revealed the fact that a large proportion of the inmates were feeble-minded. There is a considerable amount of work to be done in the Province of Quebec before adequate provision is made for the care of the mentally defective, but the government has shown that they are willing to be moved by facts. Provincial control of the feeble-minded involves the progressive steps of identification, registration, instruction, supervision and segregation. Identification, or diagnosis, should be based on a study of family history, economic efficiency and moral reactions along with the Binet-Simon test. Identification of the feeble-minded can best be done by the establishment of psychiatric or psychopathic clinics attached to the various general hospitals in the province, and the making of surveys in schools and various institutions. The public schools should really be the clearing house for mental defectives, but to make it satisfactory compulsory education is necessary. Every juvenile and recorder's court should have attached to it a thoroughly trained physician who could put every delinquent person through a mental test. Every prostitute should be given a mental examination. With the result of these examinations the judge would be more in a position to decide what sentence would fit the crime. The problem in the Province of Quebec is large, but the people are slowly awakening to the terrible burden of the feeble-minded and with this awakening it is felt that adequate provision will be made for the care of these people. [Author's abstract.]

Wolf, G. D. PROTRACTED FEVER IN MENTAL DEFICIENCY. [Med. Rec., November 29, 1919.]

A male child, born at full term, weighing eight pounds, after prolonged labor terminated by forceps, showed the following congenital abnormalities: six fingers and six toes on each of the extremities; contraction of left small, ring, and middle fingers; bilateral inguinal hernia. At four months the child had diphtheria which was followed by strabismus. From this time on the temperature was constantly elevated, ranging between 100 and 103, uninfluenced by time of day, food, bowels or drugs. His bowels were always constipated and he failed to gain weight in spite of frequent changes in formula of feeding, vomited after each feeding, and had difficulty in taking food from the bottle on account of nasal obstruction. The feeding trouble, however, which antedated the attack of diphtheria, was overcome at about five months and from then on the child gained in weight and the first tooth appeared at six and a half months. At nineteen months, when the patient again came under observa-

tion, he weighed twenty-one pounds. His skin was dry and pale, the subcutaneous tissues boggy but did not pit on pressure, the hair was dry and abundant, the head somewhat large (circumference 50 cm.), the anterior fontanelle open but not bulging, and no craniotabes. There was convergent strabismus of the right eye, incoördination of movement of the eyeballs, but no optic atrophy or neuritis. He held the mouth wide open, the tongue protruding, the palate was very high, the gums spongy and bleeding easily. There were fourteen teeth, all decayed, the tonsils were enlarged, the throat and nose filled with mucopurulent discharge. He showed none of the usual signs of rickets; examination of the heart showed nothing abnormal, but there were some crackling râles at both bases of the lungs. The abdomen was large, pendulous and tympanitic; otherwise negative. The cervical, axillary and inguinal lymphnodes were palpable. The fingers were thick and short, those of the left hand contracted. The mentality of the child at this time was almost nil; he did not recognize anyone, did not respond when called but became frightened when spoken to; the temperature was 101.5, respiration 22, pulse 90. The urine showed a faint trace of albumin and was strongly ammoniacal; otherwise negative. The X-ray showed a very large substernal shadow caused probably by an enlarged and persistent thymus; accessory set of phalanges on the lateral aspect of each foot; accessory set of phalanges and bifurcation and thickening of the metacarpal of the right hand; and accessory set of phalanges on the left hand. The roentgen examination of the skull showed most pronounced changes: there was extreme thinning of both tables; large, open, and slightly bulging anterior fontanelle, widening of suture between frontal and parietal bones; digital depression in the posterior fossa; obscuring of basal landmarks of the skull; bulging of the frontal bone; and round configuration of the head. All the cranial findings pointed to increased intracranial pressure. In searching for the cause of the fever nothing could be found except mucopurulent discharge from the nasopharynx. The tonsils and adenoids were therefore removed under general anesthesia. This was followed by return of the temperature to normal. The latter condition only lasted three weeks, however, when the former fluctuating febrile temperature resumed its course.

The cause of the mental condition has not been definitely ascertained, but the following conditions have been excluded through investigation of family history, laboratory tests, and X-ray examinations: eclampsia or epilepsy, syphilis, amaurotic family idiocy, alcoholism, Mongolian idiocy, and rickets. Trauma caused by forceps delivery, while unlikely from the particular knowledge of the circumstances, could not positively be excluded. The following conditions deserve, then, especial consideration: encephalitis, consanguinity (father and mother are first cousins), status lymphaticus, chronic internal hydrocephalus, and cretinism. The last condition carried more weight, especially since the mother claimed a good deal of improvement in the mental condition of the patient following a course of thyroid. [Author's abstract.]

Jansky, Johann, and Myslivecek, Zdenko. CONTRIBUTION TO FAMILIAL AMAUROTIC IDIOCY. [Archiv f. Psych., 1919, Vol. LIX, p. 668.]

The writer describes a boy, five years old, who had been helpless from earliest infancy. He was scarcely able to move hands or legs, could not sit up or take solid food; was blind, but seemed to be able to hear. He died without perceptible change in his condition. To the diagnosis of juvenile amaurotic idiocy the objections might be raised that there was no certain proof of the familial character of the affection and that the child was not of Jewish parentage. To substantiate this diagnosis the following findings at the section are described: hydrocephalus ext. and int., cerebral atrophy, sclerotic foci in the central ganglia. The microscopical examination revealed besides the typical findings in Schaffer's sense numerous heterotrophies of the ganglion cells in the medulla, hyperplasia of the nerve fibers in both lateral columns, and irregular clefts clothed with normal ependyma in the ventricle walls, and strong glial proliferations in the sclerotic foci of the central ganglia. The case was atypical in some respects, *i.e.*, in the absence of pronounced signs of paralysis and of the changes in the macula lutea. However, neither the red brown point nor the various primary and secondary changes in the retina and macula are specific characteristics for amaurotic idiocy; the only constant clinical symptom being the progressive diminution of the power of vision leading quickly to total amaurosis with corresponding atrophy of the pupils, a sign which was not found to fail in over one hundred cases. A whole series of anomalies of development in the author's case furnished proof for the view that this disease is caused by a congenital pathological tendency of the whole nervous system. A noteworthy histological finding was that of the balloon-formed distentions on the dendrites of the Purkinje cells. They have never yet been found in any other disease and they are very rare even in amaurotic idiocy. [J.]

Stern, Erich. INTELLIGENCE TESTS AND TESTS FOR ABILITY OF MENTALLY INFERIOR INDIVIDUALS. [Zeitsch. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVII, p. 190.]

It has been the custom to fit individuals for employments, but it is the author's purpose to fit employments to individuals. In recent times societies and governments have exerted themselves to make it possible for talented children to rise from lower social levels to higher professions and callings. Society is interested in awakening the force which slumbers in the masses. But this assistance of the gifted to the neglect of the handicapped is accompanied with danger. The genius always finds his way to success, but for those who have little capacity and especially for the mentally inferior it is often difficult to earn even sufficient for the necessities of life. For many of these cases it would be possible to find places where they could become self-supporting. The author proposes a method to measure the ability of these inferior persons with a view to

placing them in employments fitted to their level. Beginning with the callings which require the least mental ability—those of the ordinary farm hand and day laborer, he classifies the various employments in order of the demands they make on the capacity of the individual. He then suggests the substitution of certain tests described by him, in place of the usual intelligence tests for the purpose of determining the ability of individuals to undertake these employments. His reason for suggesting this substitution is that the intelligence tests do not bring out the fitness of individuals for this class of work. For instance an intelligence test may show that Eskimos have the intelligence of six year old children, yet, notwithstanding this, they possess great skill in various directions and are capable of performances wholly impossible for highly intelligent persons. Intelligence tests determine only the abilities which are least necessary for the ordinary demands of existence, and it is the author's aim to determine only the faculties which are indispensable for practical life. Psychomotility being the most important of these practical qualities, is the first subjected to test, that is to say, the motor force and precision, reaction time, choice of purposeful movements, attention, etc. The results of the separate tests in each individual were combined to determine his general fitness. While there was to a certain extent a control of the results thus obtained, in the sense that the estimates formed from the tests were compared with the actual performances of which certain of the individuals were capable, yet these proofs were not as thorough and decisive as the author would have desired. Other evidence of the reliability of the estimate of the capacity of the individual according to the author's method was the fact that where the persons tested were soldiers, the results obtained corresponded with the records of their performances in the service. [J.]

Jolly, Ph. STUDIES OF SPEECH IN MENTAL DEFECTIVES. [Archiv f. Psych., 1918, Vol. LIX, p. 74.]

From a comparison of the speech of a series of mental defectives with that of the same number of normal adults the author comes to the conclusion that the vocabulary corresponds in general to the degree of intelligence. The word "I" is more frequently used by defectives than by normal persons, a fact due to the egocentric tendencies of thought of defectives. The relatively concrete form of thought in defectives is revealed in the poverty of abstract nouns and verbs, the same concrete verb being used much oftener than in ordinary conversation. There is also great simplicity of construction owing to the fact that few adjectives and prepositions are used. "And" is used to a much greater extent than by normal adults, coördinating conjunctions being employed in preference to subordinating ones, thus revealing a primitive mode of connecting thought in which parataxis is used and hypotaxis is avoided. Defectives use the perfect tense in preference to the past, and the sentences give the impression of clumsy construction. To some extent the vocabulary of school children resembles that of defectives but the vocabulary of the

former gradually increases with increasing development until their speech reaches the same degree of abstractness and logical construction as that of adults, and then it remains more or less stable. School children do not use the pronoun "I" as frequently as defectives, because their thoughts are not occupied with themselves to the same degree. [J.]

Jolly. ASSOCIATION TESTS IN SLIGHTLY DEFECTIVE INDIVIDUALS. [Archiv f. Psychiat., 1919, Vol. LXI, p. 116.]

Compared with normals defectives show a tendency to react to the stimulus word by going into its meaning; there are perseverations, inclination to egocentric reactions, associations by sound, repetition of the stimulus word with addition of the article or syllable. While normal individuals prefer certain associations, defectives react with a greater variety of associations even to specially chosen words, but this is not evidence that the world of thought of defectives is more varied than that of normals, but that their thinking like their acting does not follow certain general average trends, their reactions are not mechanical like that of normals. How certain highly endowed original individuals would behave in these regards the author has never had opportunity to observe. [J.]

Probst, M. ARRESTED DEVELOPMENT OF THE BRAIN. [Archiv f. Psych., 59, August, 1918, Vol. LIX, Nos. 2-3.]

The author describes three carefully studied cases of so-called true microcephaly. Disturbances in the evolution of the ovum, abnormal tendencies of the germ especially in the direction of heterotrophy of the gray substance are the primary causes of arrested development of this sort, though alcoholism, lues, infections, changes in the ovaries and uterus are certainly contributory factors. The arrested brain growth is expressed anatomically in various ways, in microcephaly, microgyria, macrogyria, heterotrophy of the gray substance, arrested development of the brain cortex and of the medullary fibers, reduced size of the entire brain or of the frontal and occipital lobes. The clinical signs of these conditions are idiocy with general arrest of development, epileptic attacks, contractions, inability to sit or walk, absence of faculty of speech, cortical blindness, inability to suck and swallow—symptoms which must all be referred to the arrest of the development of the brain, especially of the cortex, and to the abnormal tendencies of all ganglion cells and arrested development of the medullary fibers. The convolutions of the brain are very simple in form, even rudimentary, and the corpus callosum is usually shortened or the fibers are arranged in abnormal longitudinal bundles. The pyramidal tract is usually poor in medullary substance. The arrest of development may extend equally to the entire brain so that a certain symmetry is preserved in which the relations of the sulci and gyri are preserved as they exist in the normal primitive type of brain, but, on the other hand, the degree of defective growth may be very unequal in different parts of the brain. The author is of the opinion that arrest of

development of microcephalic form cannot be called a regression to the ape type; it is rather a cessation of growth at the embryonic type. In the author's cases premature synostosis can not be regarded as the cause of the microcephaly. That the arrest of development was brought about by the intrauterine pressure is a view which must also be rejected. That it was produced by defective development of the wing of the sphenoid and of the petrous portion of the temporal is very questionable; the skull anomalies are to be regarded as result not as cause of the defective development. In the cases of microcephaly described by the author the abnormalities began in the development of the germ, giving rise to defective evolution of the brain cells and, consequently, to arrest of development of the brain. [J.]

Schneider, K. REACTION AND INCITING FACTORS IN SCHIZOPHRENIA. [Ztschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. L, p. 49.]

Every functional disturbance of the organism and every disease is the result of at least two factors, and for this reason the expression "coefficients" may be advantageously substituted for the word "cause." If the concepts spontaneous, incited and reactive psychoses are interpreted from the point of view of the coefficient theory it may be said that in a spontaneous psychosis no coefficient is recognizable; in an incited psychosis a more or less important bodily or psychic coefficient is recognizable; and in a reactive psychosis the coefficient is a psychic experience with which the content of the psychosis stands in an intelligible relation. The author describes a series of cases illustrating the more or less close relation of schizophrenia to these coefficients and shows that in the same person accesses of the disease may be produced at one time by a bodily cause (serious disease, pregnancy) and at another by psychic experiences (death of a child, marital infidelity), or that the onset may be conditioned by both coefficients simultaneously in such a way that one figures as cause (conflict between a mother and wife) and the other as the occasion favoring the outbreak (attack of grippe). [J.]

Serko, Alfred. ACUTE PARAPHRENIC ANXIETY PSYCHOSES. [Ztschr. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLV, p. 99.]

The author collected a large number of histories of paranoid psychoses and he found it very difficult to fit many of the cases into the recognized groups of this disease. The pictures fell into manifold separate groups all related to each other but all presenting marked differences. The author therefore makes the attempt to bound off a small number of relatively rare cases as a separate disease entity under the name of acute paraphrenic anxiety psychoses. The disease begins in a more or less acute form and is in all cases accompanied by anxiety, which is always present as a primary feature or in the form of hallucinations and delusions of threatening rather than of persecutory type. These psychoses were subject to remissions for a time and soon reached a culminating point after which they gradually settled into a chronic form. The course

of the disease, with repeated remissions and accesses, is noteworthy. In the cases described by the author the disease appeared after the thirtieth year of life. One case ended in death, one in recovery, and two cases, after the subsidence of the anxiety and the decay of the insane system constructed in the acute stage, settled into a chronic paraphrenic condition. These forms differed from dementia precox in numerous respects. There were no mannerisms or stereotypies, no schizophrenic disturbances of the emotional life and the psychic deterioration was not of the dementia precox type. [J.]

Popper, Erwin. DIFFERENTIAL DIAGNOSIS OF SCHIZOPHRENIC AND HYSTERICAL CONDITIONS. [Monatsschr. für Psychiat. u. Neurol., December, 1919, Vol. XLVI, No. 6, p. 362.]

In military hospitals where the diagnosis had to be made quickly and after only short periods of observation, it was frequently difficult to differentiate between dementia precox and hysteria. The author made use of a very simple test or method of examination which he found of great value for rapid diagnosis and thinking this test might be of interest to others he here gives a description of it. The author required the patient to do a sum of multiplication in the head, for instance to multiply a number composed of several places by unity, thus testing the ability to concentrate and combine the faculties used in calculation. While a tolerably oriented hysterical patient who seems quite normal and composed can answer most questions addressed to him, he fails in special problems in arithmetic which make demands on concentration. A problem such as the one table with high numbers often brings to light latent disturbances and deficient factors and at times such a problem seems to act as a "provocative" for the disease so that from the moment the problem is given the patient can no longer give fitting responses and suddenly all the symptoms of his psychic weakness in forming associations become apparent. With schizophrenics the case is quite otherwise. It is often astonishing how quickly and well patients who are almost mute and seem in a condition of stupor answer questions of just this sort. The author believes the explanation of this result with schizophrenics is in the nature of the question, the arithmetic problem being of colorless neutrality without any emotional factor. [J.]

Schneider, Kurt. SCHIZOPHRENIC WAR PSYCHOSES. [Ztschr. f. d. ges. Neurol. u. Psychiat., 1918, Vol. XLIII, p. 420.]

The author is of the opinion that dementia precox in the form of a war psychosis is not so rare as might be supposed. In thirty-six certain cases of schizophrenia he had three of this nature, which he here describes together with two others in which the onset of the psychoses seemed connected with fright. Mentioning Uhlmann's explanation of cases of this nature, the author comments: The far reaching effect of the subtle theory of Uhlmann is apparent. Beside a psychic influence on metabolism it ascribes a rôle to the mechanical shattering of the nervous system.

This theory involves a transition from hysteria to schizophrenia. The author is not in a position to discuss the serological side of the question, but he emphasizes the fact that even when the greatest caution is used in making the diagnosis, it is often possible to say with a show of reason that schizophrenic processes are activated or, indeed, "caused" by emotional experiences. [J.]

Bleuler, E., and Maier, Hans W. PSYCHOLOGICAL CONTENT OF SCHIZOPHRENIC SYMPTOMS. [*Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1918, Vol. XLIII, p. 34.]

Two cases are described, the first by Bleuler. It was that of a schizophrenic to whom the Saviour appeared dressed in a white gown like a shirt. From an analysis of the patient's delusions the Saviour proved to be a symbol of the patient's self and also of a pastor whom patient had attempted to kill because he prevented patient from approaching his daughters, of whom the patient had become enamored. Maier describes a second case, that of a patient suffering from compulsion neurosis, who in a dream beheld a red sofa upon which lay a blue dress, while over the sofa hung a picture of the patient's father. The symbolism of the dream proved to be as follows: the blue dress represented the sweetheart who was in a way connected with the mother, and above was the picture of the father which filled the patient with fear. Attention is called to the interesting similarity of the symbolic expression of the dream of the sofa in which the father was represented by the picture and the vision of the Saviour which also represented the father as preventing approach to the object of affection. The authors note that these cases are evidence of the close resemblance of the psychology of schizophrenic symptoms to that of neurotics and even to the psychology of healthy individuals. The fantastic drawings of latent schizophrenic artists have a remarkable resemblance to the peculiar dream scenes with which every person of visual tendencies is familiar in his own experience. [J.]

Stöcker, Wilhelm. FLIGHT OF IDEAS, DEPRESSIVE RETARDATION, AND SCHIZOPHRENIC DISTURBANCES. [*Ztsch. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLVIII, p. 316.]

The essential factors of normal thought are the retention of impressions and the ability to awaken them, this latter depending on the number of associations. The emotions are also important both in promoting and preventing associations, the mechanism of thought being so constituted that the impressions which possess the same feeling tone with the emotion holding sway at a given moment are those which are called into consciousness, while the memory images with opposite emotional emphasis are repressed. Interest is a factor of that side of emotion which we call attention. We understand by interest a quality of the psyche which makes it possible for us to concentrate our whole mental activity on a small field and to inhibit all other mental images not connected with the purpose at which we are aiming. Interest is made up of two antagonistic

components, namely, of vigilancy (*vigilität*) corresponding to the euphoric expansive affect, and of tenacity, corresponding to the depressive inhibitory affect. On the first depends the ability to direct the attention to new objects of contemplation, for example to stimuli from without; on the second, the ability to hold fast to a certain train of thought to the exclusion of others. In manic excitement there is a heightening of all psychic functions apparent in all fields of activity, and manifested in thought as flight of ideas. Thus it is seen that manic excitement is really referable to an overstimulation of the affectivity; for attention, as one factor of emotion is heightened, then interest as a factor of attention, and finally vigilance as a factor of interest, while, on the other hand, tenacity is correspondingly reduced. Stimulation being in the direction of pleasurable emotion, it is with the pleasurable emphasized images that association is made in manic stages with the consequence that these alone arise in consciousness. Depressive retardation of thought is produced by a general inhibition of psychic functions. Here vigilance is replaced by its opposite, tenacity, with the result that fewer stimuli both from within and without reach the consciousness of the individual. The few associations that arise correspond to the prevailing melancholy effect and are of painful feeling tone. With this knowledge of the mechanism of thought the question arises: is there any disturbance of affectivity which could bring about the "intrapyschic ataxic" form of thought peculiar to schizophrenia. The author finds the answer in a quantitative reduction, or paralysis, of the general affect tonus, with a subsequent reduction of both components of interest, *i.e.*, tenacity and vigilance. In the first place material is badly chosen, because fewer associations are made, then the inhibitory component fails to function so that ideas arise which have no connection with the main idea, and in this way the bizarre and distorted connections of thought arise. Chance often plays a part in these associations, but beside this there is another factor—the autistic thinking, as in dreams. Because of this same dulling of emotion the symbol loses its value as a symbol with the schizophrenic, and is regarded as having a real value. The author does not discuss the cause which gives rise to the schizophrenic disturbance of emotional qualities as this question lies beyond the scope of his article. [J.]

Bertschinger, Hans, and Maier, Hans W. ACTIVATION OF SCHIZOPHRENIA BY HEAD INJURY AND EXPERT OPINIONS CONCERNING SAME. [*Zeitschr. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. XLIX, p. 327.]

Differences of opinion exist as to the rôle of extraneous factors in dementia precox. Reichardt, for instance, states that external injuries and especially those which occur suddenly and only once cannot give rise to dementia precox. Schneider and others are less apodictic in their assertions. The author describes a case at length, commenting that this case seems to furnish a good basis for the conclusion that where there is proof of a close connection between the disease and the injury, schizo-

phrenia must, in certain rare cases, be assumed to be the result of head injury and expert opinion is to be rendered accordingly. In the light of the present knowledge of this disease the previous existence of a wholly latent schizophrenia or schizoid character does not practically affect the assumption of a causal relation of the injury with the disease, so long as the person in question was sane in a social sense. This is in accord with Bleuler's expressions in forensic direction, who in certain borderline cases found physiological schizophrenia, but in legal sense found the cases within the bounds of sanity and health. [J.]

Forster, E. THE PSYCHIC DISTURBANCES IN INDIVIDUALS WITH BRAIN WOUNDS. [Monatsschr. f. Psychiat. u. Neurol., August, 1919, Vol. XLVI, No. 2, p. 61.]

The author studied the psychic disturbances in several hundred cases with brain wounds, arriving at the following conclusions: The symptoms present no essential differences from those manifested in peace times as result of skull and brain wounds from other causes than projectile injuries. They are made up of symptoms due to circumscribed lesions and of general symptoms. Loss of consciousness is sometimes to be interpreted as due to circumscribed lesions of the medulla oblongata. It may disappear and result in a general clearing up without the intervention of any general phenomena or psychotic symptoms. If this clearing up takes place gradually so that the picture of a traumatic psychosis arises then it is often possible to recognize lesion symptoms which lend a peculiar character to the disease picture. The general phenomena are caused by the brain pressure, the result of the meningitis serosa which is always present and often to such a degree that it leads to more or less distinct signs of choked disc. Brain pressure may also be conditioned by hematoma or hydrocephalus accompanying infectious processes. The brain reacts to these general disturbances by a symptomatic psychosis. The amnesic symptom complex seems to be the most usual form of psychosis where there is simple brain pressure, while extreme conditions of excitement more usually accompany infectious processes and probably also hemorrhages. The lesion symptoms conditioned by destruction of brain areas lend the psychoses from the very beginning a characteristic stamp, though the resulting pictures may vary. Especially characteristic are the disturbances of optical orientation accompanied by defects of memory, and disturbances of writing and reading. Further characteristics of injuries of the frontal brain are lack of initiative and conditions resembling dementia precox. As these disturbances run their course the general symptoms gradually disappear and it is then that the lesion symptoms become more apparent, though these, too, recede to a certain degree. Without very careful examination the lesion symptoms may escape notice or may be regarded as general symptoms. During the period of recovery and later, symptomatic psychoses with the characteristic lesion stamp may reappear as result of abscesses, hemorrhages,

etc., which again cause blood pressure. Traumatic epilepsy, after the first convulsions immediately following the wound, usually reappears after the lapse of half a year or even longer and this is a very frequent consequence of wounds. The peculiar psychic disturbances accompanying these attacks do not differ from those encountered in peace times. The affective disturbances at the terminal stadium of these psychoses, after all the acute and subacute phenomena have disappeared, are conditioned by the fact that certain series of ideas have been lost as the result of circumscribed lesions. This fact supports the assumption that the affects are not fundamentally different in character, but appear so from their connection with different special ideas. The observation of projectile wounds of the brain furnishes no confirmation of the existence of an independent disease picture, *i.e.*, of a traumatic dementia. [J.]

Mattos, Mourao. KORSAKOFF'S PSYCHOSIS. [Brazil-Medico, June 19, 1920.]

In a recent thesis the author insists that Coelho, the Brazilian alienist, was the first to isolate this affection. The date at which the latter presented his contribution before the medical profession was May, 1886. Professor Fajardo, when he made a journey to Europe and learned of the new Korsakoff disease, got the impression that plagiarism from his chief, Coelho, had been committed. There are still other claimants, for, according to Dupre, no less a person than Charcot mentioned the syndrome in the course of his "Thursday lectures," but no dates are mentioned nor any reference to a published article. It is conceivable that in an affection like alcoholic polyneuritis the coexistence of mental disorder may have been mentioned independently by several men. Charcot had noted amnesia in two alcoholic women with polyneuritis. Korsakoff spoke of oniric delirium superposed on a continuous amnesia. Coelho mentions as characteristic inability to coördinate ideas of the most banal kind, mental confusion and failure of memory, the latter being the most striking behavior; half an hour after a meal there would be no recollection of the event. Memory for long past events might still be good. The claim of Coelho may be technically invalidated by the fact that he was writing primarily of beri-beric polyneuritis or probably of the general phenomenon of polyneuritis associated with mental disorders, irrespective of the particular motivation.

BOOK REVIEWS

Marie, Pierre. QUESTIONS NEUROLOGIQUES D'ACTUALITÉ. [Masson et Cie, Paris, 1922.]

In June and July of 1921 Professor Marie arranged a series of lectures for graduate and undergraduate students at the Faculty of Medicine in Paris. This resulted in a very brilliant and valuable summary of neurological problems of the day. They have been gathered in this volume of 550 pages. Dr. S. A. K. Wilson of London opened the series of lectures with an excellent exposé of the general features of Lenticular Degeneration; then follow: Cerebral Tumors, by Chatelin; Intracranial Hypertensions and Serous Meningitides, by Claude; Cerebral Sensory Disturbances, by Roussy; Traumatic Lesions of the Spinal Cord, by Guillaín; Epidemic Encephalitis, by Lhermitte; Parkinsonian Syndromes of Encephalitis, by Souques; Infantile Encephalopathies, by Babonneix; Syphilitic Muscular Atrophies, by Leri; Exophthalmic Goiter, by Sainton; Pains and their Treatment, by Sicard; Atypical Familial Nerve Disorders, by Crouzon; Pupillary Anomalies, by Poulard; Medullary Automatism, by Foix; Thyroid Psychoses, by Laignel-Lavastine; Obsessions, by Vurpas; Chronaxie, by Bourignon; Traumatic Epilepsy, by Béhague; Epileptic State, by Bouttier; and Are There Preformed Centers for Speech, by Pierre Marie.

As an exposition of the chief neurological workers in the city of Paris clustered about Marie this brilliant volume is illuminating. It is a most valuable record of a memorable occasion.

To individualize the studies herein contained is unnecessary. They are all original and stimulating; they are well illustrated and afford an excellent vision of actual neurological problems in their most modern setting.

Kläsi, Jakob. UEBER DIE BEDEUTUNG UND ENTSTEHUNG DER STEREOTYPIEN. [S. Karger, Berlin.]

This short and well prepared monograph constitutes No. 15 of the Bonhoeffer Abhandlungen. It is a study from Bleuler's Zurich Klinik, and therefore comes with an anticipation of interest as inspired by a psychiatrist of preëminence.

"By Stereotypies," the author states, "is meant those external motor manifestations, including speech, which are repeated by the individual for protracted time periods under an identical form, and which are completely isolated from the general conduct activities, *i.e.*, automatic, neither expressive of a mood, nor of any value in reality, *i.e.*, from an objective viewpoint.

Kläsi, after stating his general definition, then gives a short historical résumé of the studies made upon this type of phenomenon,

which have been recorded ever since human behavior came under observation. Of late years they have been termed "crazy actions" and been more or less neglected, until Kahlbaum in his *Katatonie* gave them special significance. Bleuler's study on "Schizophrenia" considers them more in detail and from a definitely dynamic viewpoint, whereas descriptive psychiatry has been satisfied to describe them in their myriad forms. Certain authors, Kläsi holds, have unduly limited the phenomena, practically only including verbigeration within the group, whereas others, Weygandt for instance, unduly expands it, including the monotonously repeated movements of idiots and imbeciles and the piteous repetitions of the depressed manic, both of which types are excluded by Kläsi in all those movements which are indicative of a mood expression.

The limited repeated occupation movements such as sewing, hammering, etc., are also excluded from his study, insofar as they are not an expression of an automatic concealed type of desire expressive of the entire personality. It is evident what the individual is doing and for the most part it may be said he knows what and why he is doing it.

His further differential criteria cannot be further discussed, but Kläsi takes up practically all of the recent studies in automatic movements, although touching perhaps a little too lightly on the structural side of the machine which provides the necessary innervation coördination pathways for the phenomena. The structural participating components, especially the striatal ones, are not adequately discussed, although it may be said the author is not ignorant of the problem. He takes up the earlier Wernicke concepts, but has not followed them through in their more recent evolutionary forms.

Kläsi then gives a descriptive discussion of 31 cases, grouping them as follows: (1) Stereotypies as Defense Movements against Bodily Hallucinations; (2) Stereotypies as Autistically Motivated Designs; (3) Stereotypies as Ceremonials; (4) Stereotypies as Relics or Abbreviated Leftovers of More Complicated Activities; (5) Stereotypies of Speech.

He then gives an interesting summary and bibliography. It is a comprehensive and highly interesting monograph on an extremely complex and important series of phenomena, and Kläsi has brought out the functional value of certain of the movements, and emphasized the desirability for finding out what is happening.

Kraepelin, E. ARBEITER AUS DER DEUTSCHEN FORSCHUNGSANSTALT FÜR PSYCHIATRIE IN MÜNCHEN: VIETER BAND. [Julius Springer.]

As we have already reviewed the monographs which are here collected as contributions to the work of the Psychiatric Research Institute in Munich, we will simply mention that this volume IV contains H. Hoffmann's valuable and interesting genealogical study on the Descendants in Endogenous Psychotic Parents and Entres, Study of the Heredity in Huntington's Chorea. Both of these important heredity papers come from Rüdini's genealogical bureau.

Bouvier, E. L. *THE PSYCHIC LIFE OF INSECTS.* Translated by L. O. Howard. [The Century Co., New York. \$2.00.]

It has long been recognized that while man leads all other animals in intelligence and reason, insects seem to have gained ascendance in the realm of instinct and automatic behavior. Just how much intelligence plays a part in the complicated behavior such as is found in the social insects or the digger wasps has always been a much debated question. We find ourselves in a widely different field from human psychology as soon as we attempt to answer such a question.

For those, however, who wish a presentation of the facts of insect behavior and a fair discussion of the conclusions to be drawn through this study, no book could be more highly recommended than Professor Bouvier's new book on "The Psychic Life of Insects," translated by Dr. L. O. Howard. Also for those who delight in watching the habits of insects in the field and wish to understand something of the impulses which lead to the varied actions seen, this book will serve as a delightful guide. It is written in a readable, interesting style which catches and holds the attention.

The first few chapters deal with automatic inherited actions with many aptly chosen illustrations of tropic responses, rhythmic activity and differential sensitiveness. In this part the author has not confined himself to the insects or to the arthropods but takes his examples, when they answer his purpose, from many other groups of invertebrates.

In the discussion of the evolution of instincts the author strongly defends the inheritance of acquired characters with some well arranged examples. Whether the cases cited, such as the forced change of certain insects from one food plant to another with the result that within a few generations the progeny refuse the original food plant, cannot be explained without the assumption that somatic cells influence the germinal substance, is a delicate point. However, geneticists already have a few cases where at least an induced mutation becomes hereditary and, as far as evolution is concerned, this may act in the same way as the older idea of heredity of acquired characters.

Another thesis stressed by the author is the transformation of intelligent acts to habits. Thus by the hereditary transmission of these characters they are transformed into instincts. Therefore, the highly developed instinctive acts found in insects would presuppose an intelligent act of the same sort on the part of some ancestral individual. This conception is hard to believe without crediting insects of even the lower orders with a great deal of sporadic intelligence. Further studies on these questions, it is hoped, may finally lead us to the correct answer.

The chapters on the comparative psychology of the Pomilids, Insects and Flowers, and on the Faculty of Orientation are instructive and in many ways are the most delightful part to read in the book. The discussion on the ability of the fertile female of certain hymenoptera to control the sex of the egg is very well written. This

is again a remarkable and difficult fact to credit, but it is subscribed to by most students of the problem.

Professor Bouvier has done the best he could with the problems of the psychology of the social insects, but so many important problems are as yet unsolved that it is difficult to generalize. The general question of the origin of castes in the social insects is still doubtful but some important work has been done which tends to show that in the termites, at least, food is not a factor in the establishment of any caste. However, the reference on page 342 to "Bonnier (1914)" probably refers to Bugnion's observations on a nasuate soldier which was differentiated at the time of hatching. This observation is undoubtedly incorrect. A discussion of the whole question of the origin of the castes in termites may be found in an article by Thompson and Snyder in the *Biological Bulletin*, Vol. 36, pp. 115-132, 1919.

These small criticisms which can always be made of any general broad discussion do not prevent me from believing that this book is by far the best general work on the subject yet issued and one that can be relied upon for its accuracy and fair method of drawing conclusions by all those interested in the subject. (EMERSON, Pittsburgh.)

Bassoe, Peter. NERVOUS AND MENTAL DISEASE. Vol. VIII, 1921. Series. [Year Book Publishers, Chicago.]

This is practically the only "year book" in neuropsychiatry which still survives. There is an English series, and the Jacobsohn Jahrbuch is about to resume, but this little volume goes on its mission of usefulness. It is, of course, too small to really cover the ground, but the compiler has wisely exercised his critical faculty and let little of paramount importance pass by. His sympathies are seen to be wide and there is a great deal of valuable material in this little book.

Mingazzini, G. DER BALKEN. [Julius Springer, Berlin, 1922, 160 m.]

An anatomical, physiopathological and clinical study of the Corpus Callosum by the chief neurological clinician of Italy in 212 pages and 84 illustrations cannot fail to be of interest to neuropsychiaters.

During the past 40 years the corpus callosum has been a region to which the investigators in anatomy, physiology, pathology and semeiology have paid special attention. As in other brain areas, so in this a great flood of light has been thrown in and the corpus callosum is less of a mystery than it has been for the past few centuries. Comparative anatomy has shown not only the relations between the hippocampal gyri, the longitudinal striae, and the taenia tectae, but has also traced in the advancing animal phylum the growth of the callosum and its phylogenetic modifications; physiology by its stimulus and destruction experiments has contributed its dole; pathology by tracing degenerated pathways, by noting malformations, even absences, has added its quota and the clinical study of tumors,

inflammations, hemorrhages, softenings, of apraxias and other disturbances of motion has amassed a heap of problems to be answered.

All of these aspects have been distributed in a hundred or more, yea, several hundred, monographs, papers, discussions, etc.; and inasmuch as a number of important studies on the callosum had emanated from Mingazzini's laboratory, Schupfer, Constantini, Ayala, Ascenzi, and others, he had thought it worth while to bring together as much of the material as possible. Hence this extremely valuable monograph which makes up No. 28 of the Foerster & Wiemann's Monograph Series.

Thus we find the general chapter headings as follows: Macro- and Microscopical Anatomy of the Callosum; Onto- and Phylogenetic Development; Agencies; Anatomy of the Tapetum; Verga's Ventricle; Hemorrhage; Softening; Trauma Circulation; Tumors; Degeneration; Physiology and Physiopathology; Conclusions; Literature. In each a clear, comprehensive statement of the present day problems and the solutions achieved is presented. The illustrations are numerous and excellent.

We cannot offer a résumé of the general physiopathological status of the callosum, a subject which has been actively debated for the past two hundred years, the first steps in the logical solution of which being taken by Lapeyronie in 1709-1741, who discussed the callosum as the seat of the soul. Mingazzini goes over all the hypotheses, historically; we cannot reproduce them further than saying that the callosum is the major commissural system of the entire neopallium. The course and topography of the pathways has not been completely determined but the discussion here given by Mingazzini advances and makes more definite our conceptions of the synthesis brought about between the hemispheric neopallial cortices. This synthesis permits the highest types of psychical coördination and Mingazzini accepts with some qualifications Paget's general dictum that the callosum is the organ of the highest psychical function, in that it brings about an association of the neopallial cortices.

The book is an extremely interesting and valuable discussion of a wide subject in the neuropsychiatric field and we recommend it most cordially to our readers who understand German, made easier by passing through the Latin medium.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

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ORIGINAL ARTICLES

STUDIES OF SCHIZOPHRENIC REACTIONS *

BY GEO. W. HALL, M.D., AND CLARENCE A. NEYMANN, M.D.

CHICAGO, ILL.

Since the first formulation of the concept of dementia praecox by Kraepelin (1) and its amplifications by Bleuler (2), there has always been a certain doubt as to the exact diagnosis of the disease. Clear cases corresponding to the old ideas of terminal dementia, with splitting of the personality, hallucinations and deterioration, have never given any difficulty in classification. The borderline cases have always been subject to much discussion. We refer especially to those cases observed by every psychiatrist, which at one time are diagnosed as dementia praecox, at another as manic depressive insanity. Adolf Meyer (3) recognized these difficulties long ago. He first gave expression to the idea of applying the term "schizophrenic reaction type," to those cases showing splitting of the personality and the accompanying emotional disturbances, mannerisms, negativism, stereotypism, etc. He stated that every individual is capable of reacting to a very great variety of situations by a limited number of reaction types. In cases tending toward deterioration, certain types of reactions occur which may become truly pathognomonic. Thus, negativism may no longer be a normal indifference, but a distinctly unreasoning pathological process. Therefore, the term schizophrenic reaction designating an underlying principle rather than the end result, is used.

It occurred to us that a thorough study of cases showing definite

* From the Cook County Psychopathic Hospital and the John McCormick Institute for Infectious Diseases, Chicago. Read before the American Neurological Association, May, 1922.

schizophrenic reaction types might disclose certain physical factors which would contribute in their way to the development of these pathological trends. With this definite end in view, we have studied about fifty cases. The first twenty-five cases showed certain accompanying pathological factors, such as metabolic, endocrine and toxic disturbances. The laboratory findings were used as the main basis for the classification. A survey of these findings led us to the conclusion that seven showed toxic disturbances, seven endocrine factors, and eleven remained unclassified. This encouraged us to study a second group of cases (twenty-five in number) more critically, including clinical, chemical, metabolic and psychological analyses.

The cases studied were selected on the basis of a recent onset and a definite clinical syndrome, they were subjected to a routine physical and mental examination and these were amplified by all the modern laboratory methods. The clinical and laboratory technic included the following routine observations:

First, the blood chemistry including: Plasma, CO_2 ; plasma chlorides; urea nitrogen; nonprotein nitrogen; uric acid; creatinine; blood sugar.

Second, the serologic blood and spinal fluid examinations including: White cell count (differential); red count (differential); blood Wassermann; spinal fluid Wassermann; spinal fluid globulin reactions; colloidal gold reaction; quantitative sugar of spinal fluid.

Third, observations on endocrine functions including: Basal metabolism; Kottmann reaction (4); adrenalin test; pilocarpine test; daily blood sugar test; sugar tolerance test (Janney and Isaacson [5]); sugar tolerance test to determine limit of tolerance.

Fourth, general examinations including: X-ray of teeth; X-ray of skull; urea output (twenty-four hours); Ambard's coefficient; urine examination (twenty-four hour specimen).

As it is not possible to present in detail the histories of all those studied, we have taken the liberty of calling attention to four typical cases which are given in more or less detail. The laboratory findings which seemed to have a direct bearing on the individual case are printed in italics for the sake of emphasis.

Case I. A young colored boy, aged twenty-one, was admitted to the hospital on January 12, 1922. His relatives stated that he had gone to school spasmodically from seven to fifteen years in Mississippi where he was born. He reached the third grade. He never was married and served in the army during the war. His present mental condition began about three months ago when he stated that

he was afraid someone was going to kill him and that people watched him as if to plot against him. The patient could not sleep because he said something was burning on the top of his head.

The mental examination showed the patient to be rather confused. He was not oriented for time. His judgment was poor, but he reacted well to his environment and was quiet and coöperative most of the time. His emotions were disturbed, in that he was very indifferent during the greater part of his stay in the hospital, stating that he was willing to go to an institution for care if the doctors desired this. It did not make any difference to him whether he was sane or insane. At other times he stated that he was afraid because someone was after him. He had peculiar sensations shooting through him. He did not know what caused these. The people on the street watched him and plotted against him. During his stay in the hospital, the patient suddenly attacked an attendant; it took three men to restrain him. Later he explained this by saying someone told him to kill the man.

A diagnosis of schizophrenic reaction type was made. Further examination showed that the tonsils were enlarged and there were cavities and abscesses of many teeth. His blood pressure was 174 systolic, 122 diastolic. The heart was slightly hypertrophied and the second aortic sound accentuated. The urine showed occasional granular casts with a specific gravity of 1011.

Plasma CO₂ 65.3 vol. per cent; plasma chlorides 6.4 gms. per liter; urea nitrogen 23.8 mgs. per 100 c.c.; nonprotein 43.39 mgs. per 100 c.c.; uric acid 3.15 mgs. per 100 c.c.; creatinine 2.5 mgs. per 100 c.c.; blood sugar average .09 per cent.

White count 8,640. Red count 5,900,000. Polymorphonuclears 69 per cent. Small mononuclears 30 per cent. Large mononuclears 4 per cent. Eosinophiles .4 per cent. Transitionals .2 per cent. Blood Wassermann negative. Spinal fluid: Wassermann negative. Cell count 3 per c.m.m. Pandy and Ross-Jones negative. Colloidal gold curve 0011000000. Sugar .077 per cent.

Basal metabolism increased 14 per cent. Adrenalin test negative. Pilocarpine test negative. Daily blood sugar tests varied between .08 per cent and .114 per cent. Sugar tolerance tests normal. X-ray of teeth no apical abscesses but some carious teeth. X-ray of skull negative. Urea output 24 hours 3.6 gms.

The patient was put to bed on a nephritic diet, the nitrogen constituents of the blood decreased to normal and the basal metabolism decreased to plus 1 per cent. The patient showed marked mental improvement after this treatment and was discharged.

A physical diagnosis of chronic interstitial nephritis was made.

Case II. A rather stout boy, aged sixteen, was admitted to the hospital on June 17, 1922. His mother stated that he had been backward in school, and had masturbated since an early age. He did not get along well with other children, teasing them and lately he had become very unruly. About three months ago he threw himself out of the window and broke his leg. One month ago he began

talking to an "Indian God" and since that time he had been especially stubborn. One year ago his weight of one hundred and ten pounds began to increase alarmingly until it reached the present weight of about one hundred and sixty pounds.

This patient was rather confused and was only approximately oriented for time. His general information, calculation and judgment were not good. He showed definite mannerisms, bit his fingernails, prayed a great deal, especially at night, using the rosary, but was generally quiet on the wards. He was indifferent and shut-in. Questions were answered beside the point. He stated he saw and heard an "Indian God," who told him what to do and what to tell people. This God forced him to do things and controlled his actions.

A diagnosis of mental deficiency with a recent schizophrenic reaction was made. The detailed examination showed him to be a very fat boy with subcutaneous fat accumulation and a definite deposit of fat around the waist.

Urea nitrogen 16.8 mgs. per 100 c.c. Nonprotein nitrogen 32.7 mgs. per 100 c.c. Uric acid 3.42 mgs. per 100 c.c. Creatinine 1.42 mgs. per 100 c.c. Blood sugar average .09 per cent.

White count 9,120. Red count 4,770,000. Polymorphonuclears 62 per cent. Small mononuclears 32 per cent. Large mononuclears 2.4 per cent. Eosinophiles 1.2 per cent. Basophiles .6 per cent. Transitionals 1.8 per cent. Blood Wassermann negative. Spinal fluid: Wassermann negative. Pandy trace. Ross-Jones negative. Colloidal gold curve 0000000000. Sugar .066 per cent.

Basal metabolism normal. Kottmann reaction negative. Adrenalin test negative. *Pilocarpine test slightly positive*. Daily blood sugar tests varied between .088 per cent and .111 per cent. *Sugar tolerance: Patient was able to assimilate 300 gms. of glucose without a rise of the blood sugar or a reduction of Haines solution by the urine.*

X-ray of teeth negative. X-ray of skull showed no enlargement of the sella turcica. Urine examination negative. Urea output in 24 hours 8.3 gms.

A diagnosis of pituitary disturbance was made.

Case III. A married woman, age thirty-four, was admitted to the hospital on January 28, 1922. Her husband stated that she went through the eight primary grades and took a six months business college course. She married at the age of twenty-five, always conducted her affairs well. She had had one miscarriage. Her child, six years old, was living and well. Two months before admission, she began to imagine that her son was not normal. She drank lysol just before entering the hospital because she thought she would not get well.

The mental examination of this patient showed that she was disoriented for time, that she could not retain numbers and figures because of her lack of attention, but that she was not demented. She was quiet and listless, at times depressed, however, generally speaking, she was indifferent and inadequate in her emotions. Questions

were answered coherently and relevantly. She stated that she had been melancholy because she could not sleep as her son was not normal. His head was flattened by a forceps delivery six years ago. This did not worry her but nevertheless she was not sure whether or not she would ever sleep again. Her bowels had grown shut since she swallowed soap water, she felt flat in her stomach because her bowels had "slunk" away. All the patients on the ward talked about her little boy. They taunted her, saying that she got up in the morning and did not take care of him. Occasionally she felt light in her head. The taunting at home compelled her to drink soap water.

The diagnosis of schizophrenic reaction type was made. The patient was found to have a pronounced growth of hair on her chin and in the small of her back. The thyroid gland was slightly enlarged. There was a fine tremor of the hands, dermatographia was present, von Graefe was positive, pulse was 118 at rest. Both tonsils were buried and cryptic, pus could be expressed from the left tonsil. Blood pressure was 114 systolic, 76 diastolic.

Plasma CO_2 53.8 vol. per cent. Plasma chlorides 5.7 gms. per liter. Urea nitrogen 24.2 mgs. per 100 c.c. Nonprotein nitrogen 48 mgs. per 100 c. c. Uric acid 3.5 mgs. per 100 c. c. Creatinine 1.12 mgs. per 100 c.c. Blood sugar average .1 per cent.

White count 18,000. Red count 5,100,000. Polymorphonuclears 78 per cent. Small mononuclears 18.6 per cent. Large mononuclears .8 per cent. Eosinophiles .4 per cent. Basophiles .4 per cent. Transitionals 1.8 per cent. Blood Wassermann negative. Spinal fluid: Wassermann negative. Cell count 1 per c.m.m. Pandy and Ross-Jones negative.

Basal metabolism increased 35 per cent. Kottmann reaction positive. Adrenalin test negative. Pilocarpine test negative. Daily blood sugar tests varied between .097 per cent and .13 per cent. Sugar tolerance tests normal.

X-ray of teeth negative. X-ray of skull negative. Urea output 24 hours 4.2 gms. There were occasional granular casts and a trace of albumin in the urine. Its specific gravity was 1007.

A physical diagnosis of hyperthyroidism, chronic tonsillitis and nephritis was made.

Case IV. A well developed young man, age twenty-three, was admitted to the hospital on January 2, 1922. The doctor who brought the patient in stated he had finished eighth grade at the age of thirteen, and had later gone to business college. He was born in Tennessee. Since an early age the patient had been suffering from self-consciousness, he had stolen many things in his career, and had been imprisoned in Ohio eighteen months because of a holdup. The patient attempted suicide on several occasions, the last time in November. There had been a number of homosexual experiences. The doctor referred him to the hospital because the patient stated he felt like committing another crime.

The patient was very much in contact, with excellent intelligence.

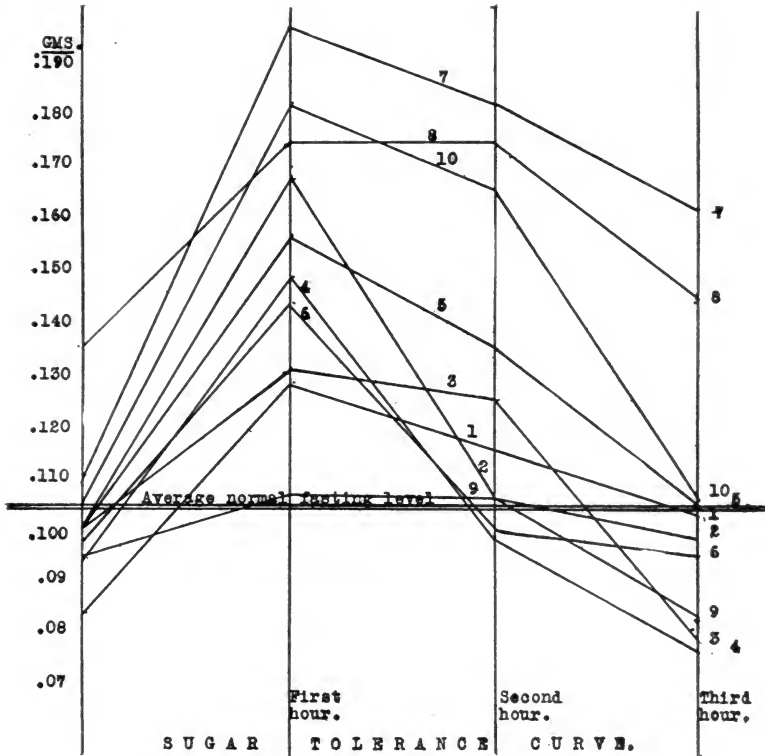
He stated that he feels slightly nervous because he is oversensitive. He worries a great deal about being self-conscious. Whenever he is among people he feels out of place and thinks that everyone is watching him. People believe him queer. These ideas are especially prevalent when there is noise or hubbub. At such times he feels mentally inferior to his surroundings. Lately he has had dizzy spells and hears a peculiar ringing sound in his ears. There is a definite odor of perspiration about him. During part of his stay in the hospital, patient became extremely suspicious of the doctor's intentions. Later, this trend was overcome.

The diagnosis of schizophrenic reaction type was made. The physical examination and laboratory tests were absolutely negative, though the same routine was carried out as in the previous cases. The psychoanalytic investigation revealed the following factors: The self-consciousness which disturbed him so much and usually forced him to commit a crime, was traced back and associated with his fifth year when he remembered that he was awkward and the boys said he was like a girl. He was mother's and grandmother's boy, fearing his father. At the age of four, his sister "milked his penis," since then he had had sex on his mind. He often thought of legs and associated these thoughts with his mother's later pregnancies and the large breasts of his teacher. Patient was very perturbed during the analysis, frequently flushed and showed signs of an abreaction. He stated he was ashamed, felt restless, self-conscious and inferior. Felt as if he had committed a grave wrong. All intercourse was wrong and made him think of doing criminal acts. These were then turned into compensatory factors for his feeling of inferiority. The patient recovered after the analysis.

It is seen by these sketches, that the first case has a definite toxic complication, the second and third cases show marked endocrine disturbances, whilst the fourth case was associated with a psychic complex. In the perusal of our case histories, we feel justified in taking these four cases as examples for the various groups into which our cases may be divided, namely, a toxic group, a group showing endocrine disturbances and a group with psychogenic factors.

Twelve of the twenty-five cases fall into the first group, seven are included in the second, five comprise the third, one could not be classified. As yet we are not prepared to go on record as to the relation between cause and effect. It is a fact that these disturbances exist as a part of the clinical picture and must be taken into consideration in the study of any case coming within the realms of the subject under discussion. We have purposely avoided the term "dementia praecox," believing as we do, that this term represents a clinical syndrome, not a disease entity. Therefore, we have the temerity to suggest the use of schizophrenic reaction type as a much

more representative name. One can speak of a schizophrenic reaction type, associated with toxic conditions, with endocrine disturbances and with psychogenic factors; or if desirable, a simpler terminology may be substituted such as a toxic, an endocrine, or psychogenic schizophrenia.



ADDENDUM

We have also determined the blood sugar tolerance in accordance with the methods of Raphael and Parsons (6). The accompanying chart shows the various sugar curve levels of ten cases. Taking it for granted that the normal curve is as recorded by these authors, we have ascertained that two of our ten cases returned to the normal fasting level within two hours; five of the ten returned to the normal level within three hours. Our results practically agree with theirs in that in eight cases the initial fasting level was lower than normal and the acme of the level was relatively high.

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A CASE OF RECKLINGHAUSEN'S DISEASE WITH
INVOLVEMENT OF THE PERIPHERAL NERVES,
OPTIC NERVE, AND SPINAL CORD *

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A disease that manifests itself in different and widely separated parts of the central nervous system always commands attention because of the complexity of the clinical picture it produces. While the form of Recklinghausen's disease which involves the cutaneous and peripheral nerves is relatively common, the type which is characterized by multiple tumor formation in the spinal canal and cranium is less often seen.

Christin and Naville collected twenty-three cases of central neurofibromatosis; two of these patients had tumors of the optic nerve with symptoms dating from childhood. One patient had thirty-one tumors inside the skull, all of which were of different types including gliomas, fibromas, myxomas, osteomas, and endotheliomas. Basso reported the case of a patient who had numerous neurofibromas growing on the cranial nerves, peculiar cellular changes in the brain, and vascular changes in the pia mater. All the tumors were of one type, neurofibroma, with medullated nerve fibers running through the mass. These apparently were the remains of the nerve on which the tumor had grown, and not essentially a part of the tumor itself.

Cushing quotes the experiences of numerous observers who had found neurofibromas and dural endotheliomas inside the same cranial cavity. He considers that, in some way, generalized neurofibromatosis, isolated tumors of the nervus acusticus, and fibro-endotheliomas of the meninges are associated.

The association with acromegaly(2), cheiromegaly(9), adrenal insufficiency(3), osteomalacia(6), and anomalies of growth (10) is well known and there are many theories as to its origin. The hereditary quality has been well studied by Preiser and Davenport who analyzed thirty cases of the familial type and showed that the tendency to Recklinghausen's disease is a dominant character.

* Presented before the Minnesota Pathological Society, February, 1922. Minneapolis.

Most authors conclude that disease with such definite hereditary qualities and so widespread an influence must have its origin during the early growth and development of the individual, believing that there is some developmental anomaly of the germ plasm which, with or without an appropriate stimulus, gives rise to multiple tumors of the central nervous system or its coverings.

The histology of neurofibromas of the peripheral and cranial nerves is not completely understood. Various investigators insist that they are composed of ordinary fibrous tissue completely unrelated to nerve structure; while others who find fully formed nerve elements in the tumors conclude that they are directly formed from elements of the central nervous system. The names given by various observers to neurofibromas of the acoustic nerve show a variance of opinion with regard to their actual histology, but this may be owing to the fact that different parts of the same tumor give different histologic pictures. The peripheral nerve tumors of Recklinghausen's disease also do not always have the same histological appearance, which accounts in part for the dissimilar views.

Verocay, who studied carefully the structure of these tumors, was of the opinion that they were composed of a peculiar neurogenous tissue that originated from the early embryologic elements of the central nervous system. He called them "neurinomas" and believed that nerve fiber cells or corresponding embryonal cells which have not reached the normal structure of nerve tissue constituted the basis of the tumor. He noted the frequent association of these peripheral and cranial nerve tumors with dural fibro-endotheliomas, and that the adjoining mesoblastic tissue was sufficiently influenced by the faulty development of the ectodermal embryonic central nervous system to produce these endotheliomas.

The fibrous and reticular areas in these tumors, as described by Cushing, are representative of connective tissue and neuroglia but the fibrous elements do not stain quite like fibroblastic tissue, and the reticular element, while it resembles closely glial tissue, is lacking in many of its characteristics. Cushing considers them to be true nerve tumors arising from nerve tissue elements even though these elements are considered to be the binding or supporting structure for the conducting paths.

Lhermitte found in a tumor excised from a man suffering from Recklinghausen's disease authentic nerve cells of central type. He concluded that the disease was not a true nosologic entity since lesions at the base of the tumor were not uniform and that the most differentiated of tissues, namely, the central nervous system, could defi-

nately give rise to tumors. He also concluded, like others, that the tumors were offspring of embryonic vestiges aberrantly scattered throughout the body.

The problem of origin of these tumors whether from fully developed or embryologic nervous tissue is yet to be settled and remains a subject for interesting research and speculation.

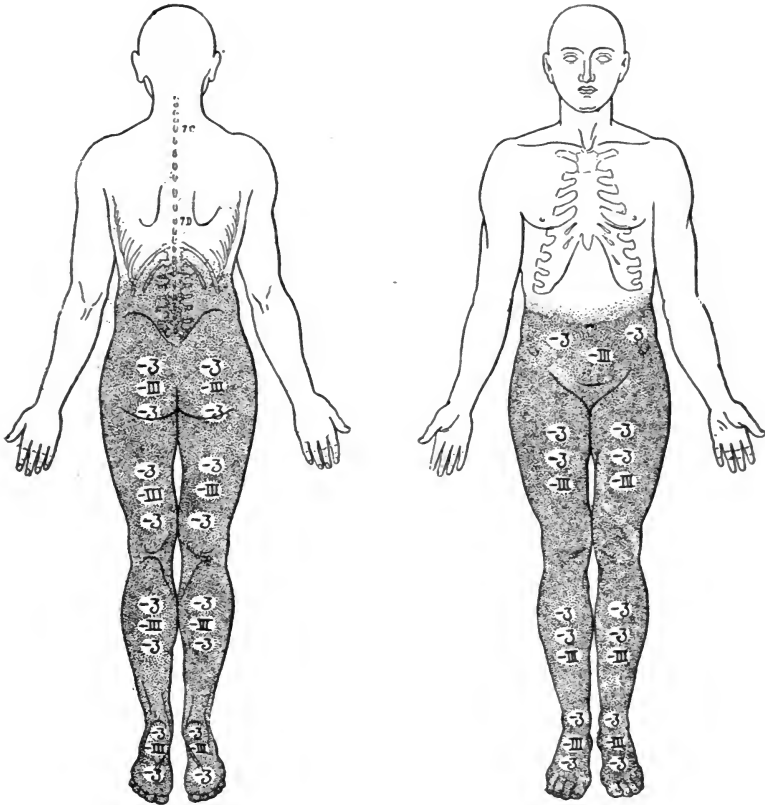


Fig. 1: Degree and location of sensory changes below the tenth dorsal segment. Arabic numerals represent degree of diminution of pain and tactile sensibility. Roman numerals represent degree of diminution of thermal sensibility (-4 = complete loss, -3 = severe diminution, -2 = moderate diminution, -1 = slight diminution, and 0 = normal).

The following case is reported as an illustration of the association of neurofibromas with dural fibro-endotheliomas:

Case A311349. Mr. B. P., aged twenty years, presented himself at the Mayo Clinic, April 8, 1920. He complained chiefly of a swollen left eye, and difficulty in walking and in using his hands

(Fig. 1). Although every attempt was made to elicit anything suggesting the manifestations of Recklinghausen's disease in his immediate relatives, the results were completely negative. When he was four years of age a horse had stepped on his right foot and about one year later his right toe had begun to catch in the ground, and he had had to raise his right foot high to prevent disability. At the age of ten a tendon had been transplanted to relieve this with very little success. About the age of thirteen he had had a severe attack of mumps, followed by a swelling and gradually dimming vision of the left eye. At the age of sixteen, in the summer time, he had been seized with a severe attack of nausea, vomiting, and bilateral frontal headache, associated with temporary blindness. The attack had lasted from three to four days and had been repeated each summer until the time of his examination. At the age of seventeen, he had noticed wasting of the muscles of his left hand and forearm, inability to extend the little and ring fingers, and weakness of the adductor of the thumb of that hand. The weakness in forearm and hand had been becoming slowly worse. Two months before he had begun to notice progressive difficulty in walking after dark with a sensation of numbness of the feet and legs. Just before the examination lack of sphincter and bladder control, with urgency and difficulty in retaining urine, developed.

General examination revealed a tall, thin, intelligent youth with a bulging left eye and an ataxic steppage gait. Pulse, temperature, blood pressure, heart, and lungs were all normal. Two hard nodules about 2 cm. in diameter just under the skin in the antecubital fossa of the right arm were noted. A third smaller nodule was incorporated with the left ulnar nerve at the elbow, a fourth about 4 cm. long was felt under the skin, near the inner head of the left calf muscle, and a fifth was so well incorporated with the external popliteal nerve on the left side that it could not be measured. There were no other nodules palpated nor were there any skin tumors manifest. A fawn colored cafe-au-lait tinted patch 5 by 10 cm. was noticed on the skin just under the left nipple.

Vision in the right eye was 5/6. The lids, conjunctiva, cornea, anterior chamber, iris, pupil, and fundus were all normal. Vision in the left eye was 6/30. The upper and lower lids were both swollen, slightly red, and had a doughy sensation to touch. The ptosis of about 3 or 4 mm. of the upper lid was caused, no doubt, by the swelling. Exophthalmia measured 9 mm. by the ophthalmometer. With the eye in a primary position the visual axes were parallel. There was good movement to the right and to the left although the eye was elevated only about 10 degrees above the primary position and about 20 degrees below. The palpebral conjunctiva was only slightly affected. Injection of the deeper vessels was noted in the depths of the fornix. At the temporal side of the globe was a soft edematous mass which showed faintly through the conjunctiva. The margin of the orbit was not eroded. The supraorbital fissure could easily be made out by palpation but the infraorbital fissure could not

be felt. The eye could not be displaced backwards by pressure. There was no swelling of the tissues of the cheek or face beyond the orbital rim. The ocular conjunctiva was clear, as was the cornea, and the anterior chamber was normal in depth. The iris was dark



Fig. 2: Case A311349. Atrophy and deformity of the left hand and protrusion of the left eye.

blue and the pupil was round and 2.5 mm. in diameter, equal to the right in size. When the pupils were shaded from the light the right pupil reacted slightly more than the left. Convergence reflex was good. There was no swelling in the neighborhood of the lacrimal sac and the preauricular glands were not enlarged. The fundus of

the left eye had a choked disc of two diopters and a cilioretinal artery was present with an opticociliary vein.

A twelve-hour specimen of urine (400 c.c.) showed a specific gravity of 1.030, acid reaction, and a trace of albumin; microscopically, it was negative. The hemoglobin was 77 per cent, the erythrocytes numbered 4,500,000, and the leukocytes 6,800. The Wassermann test on the blood was negative; no spinal fluid examination was made. Roentgen examination of the orbit did not reveal erosion of the bone, and in a lateral view of the skull the sella appeared to be normal. The report of the Bárány test was as follows: "The reduced vertigo and past pointing after stimulation, together with increased time for induction from the vertical canals and spontaneous vertical nystagmus, suggests pressure at least."

Neurologic examination: The first, fifth, seventh, ninth, tenth, eleventh, and twelfth cranial nerves were normal, the report of the eye examination covers the findings in the second, third, fourth, and sixth, and function of the eighth as tested by a watch was diminished on the left side in proportion of 12:36.

There was marked weakness and atrophy of the muscles of the left arm and forearm in the area supplied by the ulnar nerve. The anterior tibial and peroneal muscles and the extensor of the toes of the right foot were weak, atonic, and atrophic and there was well marked foot drop. There was, also, a spastic weakness of all muscles below the tenth dorsal segment.

The diminution of sensation to pain, touch, and temperature below the tenth dorsal segment was clear cut (Fig. 2). The level between almost complete loss and normal was sufficiently sharp to be of good localizing value. Joint sensibility, bone conduction, and the sense of pressure-pain were correspondingly diminished.

Reflexes were normal in the supinator, biceps, and triceps tendons, but exaggerated in the patellar and Achilles tendons, and a definite Babinski's sign with the usual associated phenomena were present in the left foot; these were not present on the right side, however.

The control of the bladder and rectal sphincters was slightly diminished.

The upper extremities were normal, but the heel-to-knee test in both lower extremities was poorly performed. The gait was ataxic, and spastic to a less degree; there was also a steppage gait in using the right foot. In making the Romberg test, inability to stand with bare feet together and eyes closed was noted. There was no tremor, and speech was normal.

A diagnosis was made of diffuse neurofibromatosis, or Recklinghausen's disease, involving the left ulnar, right external popliteal, and other peripheral nerves. It was believed that there was also a tumor on the left optic nerve and one compressing the spinal cord at the level of the tenth dorsal segment, probably part of the same disease. Surgery was advised and the nodules in the right antecubital fossa were removed to corroborate the diagnosis. The pathologist reported that the nodules were neurofibromas.

April 4, 1920, the Kronlein operation was performed for removal

of the orbital tumor from the left eye. The eyeball was saved for cosmetic reasons, although vision would necessarily be lost after the operation. After resection of the lateral wall of the orbit a firm, fibrous, flat tumor 2 by 5 cm. was removed. Since the tumor had surrounded the optic nerve, this also was removed. This tumor proved to be an endothelioma psammoma.

May 2, a laminectomy was performed and the sixth, seventh, eighth and ninth laminae of the dorsal vertebrae were removed. A tumor 2 by 1 cm. was found situated on the dorsolateral aspect of



Fig. 3: Case A311349. a. Orbital tumor with optic nerve, markedly reduced in caliber in the center. b. Tumor from the peripheral nerve in the leg. c. Tumor from the peripheral nerve in the arm. d. Tumor from the spinal canal.

the cord, arising from the dura and lying between the dura and the arachnoid, opposite the seventh and eighth thoracic vertebrae. The pathologist reported this tumor also to be an endothelioma psammoma.

July 14, the left ulnar nerve was exposed and the nodule removed, and also the nodule in the calf of the left leg. These small tumors were neurofibromas.

The patient recovered very well from his multiple operations. His gait improved remarkably so far as the ataxia and spasticity were concerned. His steppage gait, however, remained the same. He

regained control of his bladder and rectal sphincters and the sensory loss in his lower extremities was reduced to a negligible quantity.

August, 1920, the patient was dismissed. October, 1921, special inquiry was made with regard to (1) power of walking; (2) weakness in the hand, and (3) the appearance of new symptoms. The patient promptly replied that he was feeling perfectly well. His eye was not troubling him greatly, although he had some pain in it at times. He was able to walk on the average three miles a day for exercise without any appreciable fatigue. He had given up wearing

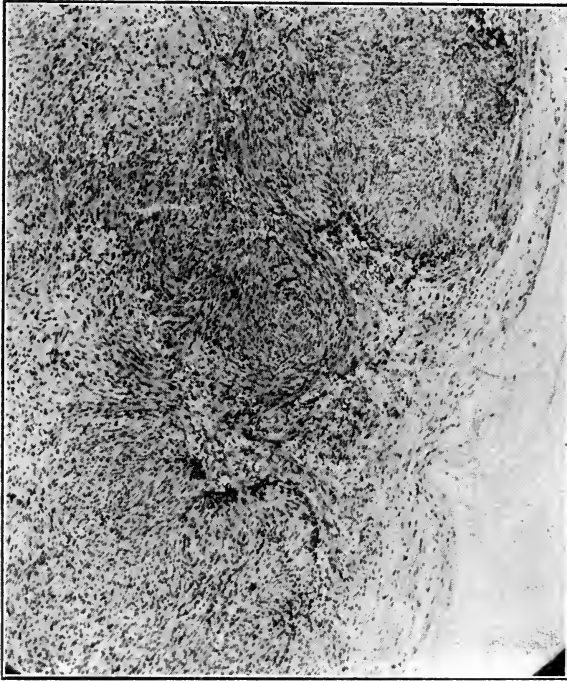


Fig. 4: Case A311349. Neurofibroma removed from the peripheral nerve in the arm. Capsule of tumor and usual whorl of fibroblastic cells with neuroglia-like reticular tissue (hematoxylin and eosin X 50).

a brace on the right foot as he was able to raise the leg high enough to prevent the foot from dragging. He said that his left hand was much stronger, but he was unable to straighten his fingers. The answer to the last and perhaps most important question is given in his own words: "I have developed no other troubles and I am in the very best of health; my headaches are not so frequent; in fact, I hardly ever have them now and then only after a bad cold."

The nodule removed from the peripheral nerves had the uniform histologic appearance of neurofibromas (Fig. 3). They were

smooth, rounded, firm, and encapsulated. Their cut surface was smooth and there was no sign of central degeneration. They were stained with hematoxylin and eosin and by the Weigert-Pal and Bielschowski's method.

In the specimens stained with hematoxylin and eosin (Figs. 4 and 5) the cellular and supporting structure of these tumors showed the two types of tissue described by Cushing, namely, the dense interlacing fibrous bands and the loose reticular glialike tissue. The nuclei of the first type were long and ovoid and were arranged in

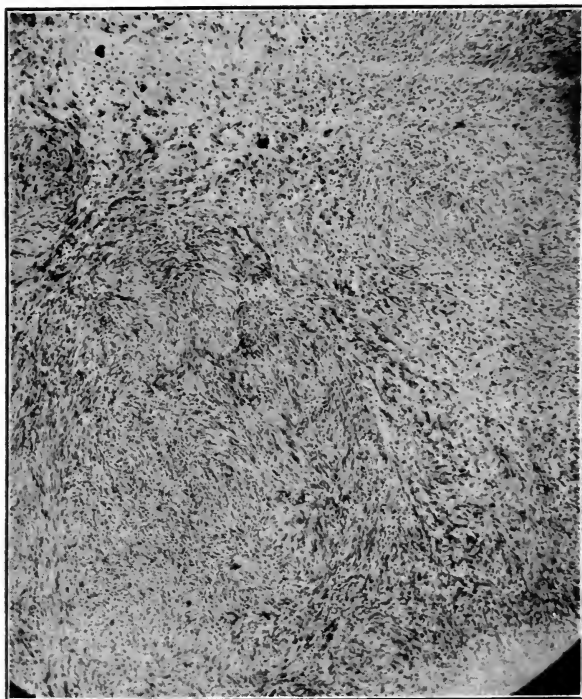


Fig. 5: Case A311349. Tumor from the peripheral nerve in the leg. Whorls of cells and reticular tissue (hematoxylin and eosin X 50).

sheaves, whorls, and concentric rings. At the periphery of some of the sections the palisade-like arrangement of nuclei in parallel rows was found. They were also arranged in parts to form a convoluted tube with nuclei forming a sort of sheath for the fibrils in the center. The difference between these two tissues was well marked and the loose reticular areas strongly resembled glial tissue with the small round dark homogeneous cells in a reticulum of fine fibrils. Under the Bielschowski method of staining, the meshwork of fibers, in which the small round cells of the reticular area were set, was clearly seen.

The sections stained by the Weigert-Pal method, while they showed a few medullated fibers outside the capsule of the tumor, unlike the sections in Bassoe's case, did not reveal medullated fibers in the body of the tumor.

The orbital tumor was a typical dural endothelioma with psammoma bodies arising from the dural sheath of the optic nerve (Fig. 6). The cells were the usual flat pale polyhedral cells with pale nuclei containing many fine chromatin particles. They were arranged in irregular masses, whorls, and concentric rings. In some of the concentric rings there was hyalinization later passing on to the

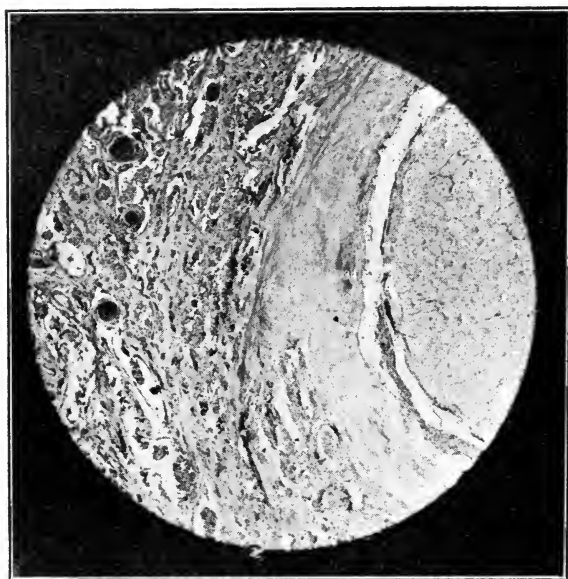


Fig. 6: Case A311349. Endothelioma psammoma arising from the dural sheath of the optic nerve. Marked degeneration of nerve, and a few endothelial tumor cells between the sheath and nerve (hematoxylin and eosin X 40).

calcification of psammoma bodies. In places cells were still seen surrounding a psammoma body (Fig. 7). The optic nerve was markedly degenerated and between the sheath and the nerve itself were some irregular clumps of endothelial cells showing a beginning invasion of the nerve substance.

The spinal cord tumor was also an endothelioma with psammoma bodies (Fig. 8), and differed in no way from the orbital tumor. The surgeon, at the operation, was well able to demonstrate its origin from the dura. Nerve tissue was not visible in these two tumors, by the Weigert-Pal and Bielschowski methods of staining.

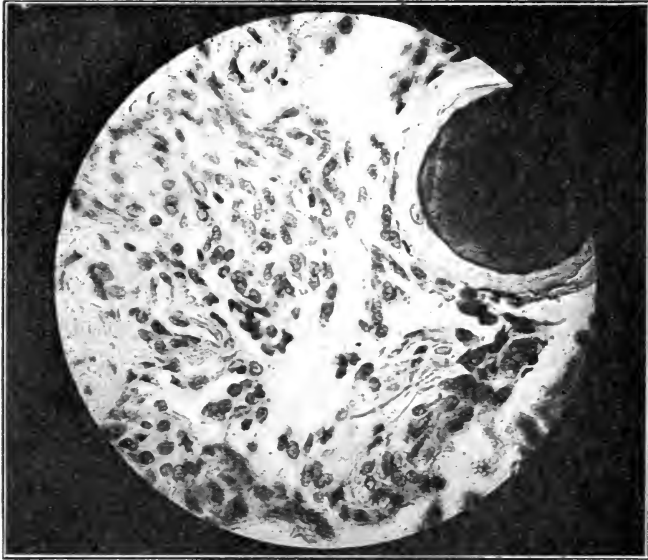


Fig. 7: Case A311349. Endothelial cells and psammoma body (oil immersion X 350).

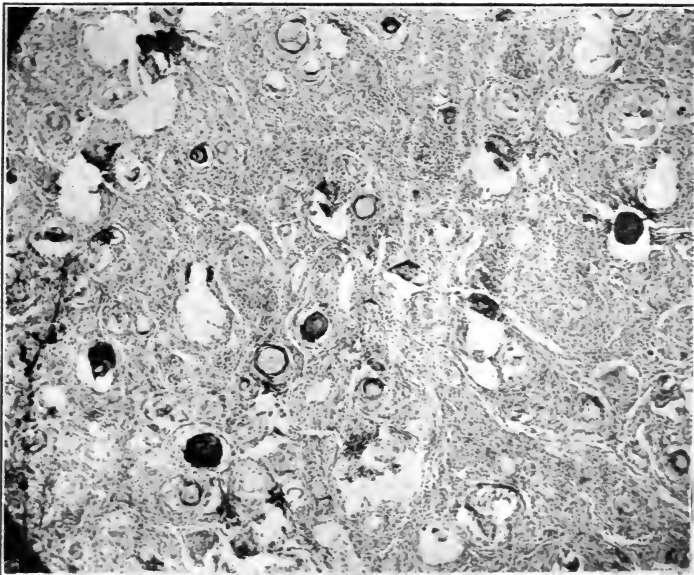


Fig. 8: Case A311349. Tumor in the spinal canal. Endothelial whorls and psammoma bodies (X 50).

SUMMARY

1. Interest in this case is centered mainly on the widespread involvement of the central nervous system with a slight manifestation of cutaneous disease.

2. The peripheral nerves, the left optic nerve, and the spinal cord were affected by multiple tumors. There was no definite evidence of involvement of the eighth nerve. This is unusual but may develop later on in the progress of the case.

3. The tumors on the peripheral nerves were neurofibromas while the two occupying the orbit and spinal canal respectively were dural fibroendotheliomas. This association of tumors of different histologic appearance in the same patient at the same time is unusual, but the condition has been reported by other observers.

4. The patient is still alive and leading an active life more than twelve months after the many operations. It is too much to hope that he will remain free from recurrence, but thus far he has not developed any new signs of Recklinghausen's disease.

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THE MENTAL SYMPTOM COMPLEX FOLLOWING CRANIAL TRAUMA

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The advisability of properly restricting the material from which one may draw conclusions as to the mental symptoms following cranial trauma is self-evident. For precise deduction in this regard one must be sure he is not dealing with cases which present gross associated conditions,—syphilis, epilepsy or alcoholism. In fact epileptic taints, hypophrenia, preëxistent psychotic or psychoneurotic manifestations, and psychopathic determinants in general are all too commonly evident in the case histories in this connection.

It, therefore, appears that careful delimitation of the material is necessary if we are to obtain a more accurate concept of the situation and that many spurious allegations in this connection must be eliminated. For example, trauma was once considered a cause of paresis. Since the specific nature of the disease has been proven, we are enabled to regard trauma from an entirely different standpoint. Here, as elsewhere, head injury may act as a major exciting factor in the development of a psychosis in one so inclined by inherent or acquired traits. Knowing, as we do, the remarkable intolerance for alcohol which is shown during convalescence from concussion, we must give serious attention to the importance of inebriety at the time of injury, in relationship to the immediate subsequent psychical manifestation.

With all the protean pretraumatic complicating features that may exist, it is easy to understand why trauma as the cause of any mental disease entity may be viewed with reserve. The diversity of the clinical symptoms presented in cases of alleged traumatic origin are such that a cross section will not suffice. One must have some reliable data from a longitudinal viewpoint of a patient's career if one is adequately to understand the phenomena, show that certain changes have taken place or appreciate the subtle and the gross alterations in the mental, character and personality makeup of the individual. In fact, the momentary cross section in some cases will fail to indicate the mental disorder which may exist.

In lieu of the fact that severe cases of concussion or brain injury are immediately sent to a hospital for the care of surgical patients with a view toward the advisability of surgical intervention, the psychiatrist seldom has an opportunity to observe the acute manifestations. By the time the patient has reached a mental hospital, if indeed he does at all, he is in a subacute or chronic stage of the illness. The surgeon, all too often, correlates the physical and neurological symptoms in detail, from day to day, but contents himself with statements that the patient is "unconscious," "comatose," "delirious," "mental condition unchanged," or whatever set-phrase may seem to cover the condition. Therefore, the content of a delirium, the dreams and other psychic phenomena, which may be of extreme significance to the psychiatrist later on, are lost.

The primary task of collecting, for study, a series of authentic and uncomplicated cases has been fraught with considerable difficulty and such that those hereinafter reported represent the few selected from a considerable number personally observed. To this small group have been added a few from available clinical records which seemed sufficiently comprehensive to allow their inclosure in our study.

It may be worth while to review such cases from the literature as tend to conform to our criteria.

In 1903, Richardson cited the case of a chorister boy, who was struck on the head by a heavy incense vessel which rendered him unconscious for a short while. According to the description, he had a severe headache, showed some change in disposition, was more irritable, somewhat lethargic and had difficulty in performing ordinary work. He soon developed attacks of maniacal excitement resembling psychical epilepsy, coming on suddenly, except that they were preceded by a severe headache, the maniacal attacks lasting an hour or so, later continuing for a day or more, and terminating in sleep. He was entirely delirious and incoherent during the attacks. These recurred more frequently until they came every few days. He showed a marked anemia which became pronounced within a few months, his complexion being quite waxy in appearance. The scar on the head was sensitive and trephining was advised. The bone was not injured. There was no adhesion of the dura and no evidence of adjacent disease. There was some bulging of the dura and no pulsation when first exposed. There was general leakage of the serum and the next morning pulsation was present. The scalp healed after some suppuration and the patient had no return of the maniacal attacks, became gradually of ruddy complexion and within a few

months was the picture of health. He had no convulsions at any time.

Glueck, in 1911, reported five cases. The fifth patient was a Scotchman of average education who had made a good adjustment in life and was a manager of a real estate firm at the time of his injury, which was incurred by striking his head against the pavement in a fall from a horse. He denied having been intoxicated at the time. He was dazed, remembered trying to get up, but had an amnesia for certain subsequent events. He faintly remembered having a convulsion after being placed in bed. These epileptiform seizures lasted for a period of two weeks and he was told that he had thirty-six seizures in one day. He suffered from a motor aphasia, was unable to speak for one month, was confused, suffered memory impairment and an occasional headache. A little over four months after the injury he was discharged as recovered. He then secured a low-salaried position in a bicycle shop, and later enlisted in the army where he had great difficulty in making an adjustment, being court-martialed five times during his first enlistment. He then attempted to make an adjustment in civilian life but failed. He reënlisted and had a summary court-martial for absence without leave on account of inebriety. He was admitted to the Presidio Hospital, where he was nervous, egotistical, pugnacious, had fixed delusions about religious matters, prevaricated, was obscene, abusive and irresponsible. On admission to the St. Elizabeths Hospital, he showed a hypomanic state, was excited, had flight of ideas and prevaricated a great deal. Later on a depression set in from which he gradually recovered. He was later discharged to accept a position with the Salvation Army.

In 1914, Marie reported a case of a naval gunner, aged twenty-six, who met with an accident in 1906, causing a large wound upon the left side of his scalp over the motor area of Broca. This was followed almost immediately by epileptic seizures. The patient recovered from these under bromide, but they left some mental impairment. As he was no longer able to serve in the navy, he was employed as a nurse in the hospital. In 1907, he again injured his head; the seizures reappeared with mental dullness. He recovered for some months, then had another seizure, while in Paris, and was sent to an asylum. There he was dull, confused and morbidly emotional. He had marked motor signs, oculopupillary troubles and his speech was affected, slow and scanning, as if he had something in his mouth. There were no other symptoms and no history or signs of alcoholism or syphilis.

Mott, in 1917, cited the case of a man, serving as a gunner in the Royal Garrison Artillery, who was sitting in a corrugated iron hut fifty yards from some boxes of cordite cartridges when a shell landed, exploding them. The man became unconscious at once, his breathing was stertorous, his body showed no sign of wounds. On the same day he was removed to a clearing station and thence to a casualty clearing station; in the evening of that day, he died. The medical officer there stated that the patient was absolutely unconscious and could not be roused. The breathing was stertorous and slow, pupils were equal and reacted to light and the knee jerks were difficult to obtain. There was extensive hemorrhage upon the under surface of the orbital lobe without visible injury. The cortical, arterial and capillary vessels were empty. The perivascular sheaths were in many cases dilated and filled with cerebrospinal fluid. The cortical neurones were swollen, the nuclei were large and clear and the basophil substance diminished in amount, a condition very like that observed in the cortex of an animal in which experimental anemia had been effected.

In 1917, MacCurdy, in his article on "War Neuroses," reported three cases illustrating the early effects of concussion on individuals previously normal in their make-up and in good health when the accident occurred. The first patient was a Canadian, aged twenty, commissioned in the English Royal Flying Corps, who received his concussion in a crash. He was unconscious for about four days. With returning consciousness and during the following two weeks he had a marked memory defect, was confused, disoriented and talked in a loud voice with delusional and delirium-like ideas, was restless and excitable, and showed a marked intellectual defect which he did not appear to appreciate. In the following two weeks he gradually became more tractable, somewhat more in touch with his surroundings, oriented, had returning memory for immediate events prior to his injury and considerable improvement as evidenced by intelligence tests, but a persistent defect for grasping more subtle situations. The second patient was a major in the artillery, aged thirty-nine, who received his concussion when a shell pierced the dug-out where he was. He had a large bruise on the occiput. He remembered that the battery was being bombarded and the last thing turning some dispatches over to his captain. His next memory was of awakening in a casualty clearing station, three or four days following the injury. After the injury he was partly conscious but fainted in the field, following which he insisted on taking charge of the battery, but was dazed and confused. During his first week in

the hospital, he remained confused and disoriented, had a headache and suffered from intense photophobia, poor vision and troublesome dreams. A few days after this, his confusion began to clear up, but he spoke in a monotonous, slow voice, had difficulty in choosing the right word and in concentrating his mind on any topic. He had visions of the Messines Ridge on going to sleep. A superficial analysis of his dreams showed a distorted jumble of ideas concerning details while on duty at Messines. More than a week later his sight was still subjectively poor, he had some ataxia in his movements, his speech improved except for a slight defect and he retained an amnesia for at least three days following the injury. The third patient, another officer, aged thirty, was buried and rendered unconscious for a short time by débris from a bursting shell. After regaining consciousness, he carried on in a dazed sort of a way for about seven hours, when he was buried in a similar manner and awoke six or seven hours later in a casualty clearing station, suffering from a terrible headache and incoherency. For the next two or three weeks he was at times conscious, at other times not. He felt confused and dizzy whenever he sat up in bed, and from the fourth until the twelfth day had a fever as high as 103° and 104°, following the abatement of which, he gradually improved. In the ensuing weeks his chief difficulties were an inability to choose correct words, headaches, an irritability to sudden noises but without fear reaction, poor memory, difficulty in concentration and disturbed rest on account of troublesome dreams.

Rosanoff, in 1918, translated an article on traumatic and emotional psychoses, by J. Rogues de Fursac, in which the author reported the case of a mason, aged thirty-five, who sustained a head injury in a fall of five meters upon hard ground. The patient was picked up unconscious and remained so for eighteen hours. During the first eight days, he was markedly confused, was stupid, dull, completely disoriented, reacted weakly to physical stimulation, responded only to simple questions, was amnesic, his memory extremely poor for recent events and labored as to remote. He had illusions during the day, mistaking one person for another. The greater part of the night was passed in a dream state which was chiefly occupational. He would think it was time to go to work, asked for his clothes, would get up and look for his tools, conversed with imaginary people and complained that the mortar was too thick, and so on. His attention and memory improved after the first week; he remained disoriented for time. After the first month, he began to confabulate. He had only a faint realization of his abnormal state. When told

that he was sick and must take care of himself, he showed an irritability that was not previously noted. He became violently angry, refused his medicine and wanted to leave the hospital. His condition remained almost stationary for about three months, when he began to improve. His attention and memory were restored and the pseudo reminiscences became more rare. He had no convulsive manifestations. At the end of six months he was considered convalescent with only a slight vertigo, a certain mental and physical fatigability and an amnesic gap commencing very sharply a few moments before the accident and ending imperceptibly somewhere in the course of the second month with some vague ideas that become more complete and more precise.

In 1920, Röeper, in his article dealing with slight mental disturbances after gunshot wounds of the head, related the history of a case of dipsomania following brain injury, and the history of a colleague who after brain injury developed a slight mental disturbance with a subjective sensation of mental and physical inadequacy and transitory aphasic difficulties. In a part of those who have sustained brain injury, the only result apparent is a slight mental change to which Røeper, as the result of the collection of numerous case histories, gives the name, traumatic-psychopathic constitution. Under this concept he endeavored to set forth a definite symptom picture of the conditions resulting from brain injury where there is neither epilepsy nor marked psychosis or functional neurosis. The essential features of this complex are the affective and emotional instability as shown in contrast to former behavior, high temper, quarrelsomeness, dissatisfaction, depression, affective lability, intolerance for thermic, toxic, optic and acoustic stimuli. In addition there is an intolerance for alcohol, intensive mental or physical work. The patients may show extreme lack of interest in their environment, without any real intellectual defect, dullness, lack of initiative and slight poverty of thought. Røeper assumes that the reduction of efficiency in the traumatic-psychopathic constitution may be placed at from fifteen to forty per cent, that traumatic epilepsy, in the cases coming to his attention, occurred in only fifteen to twenty per cent and that mental changes are present in from one-fourth to one-third of those sustaining severe brain injuries.

Thom and Fenton, in 1920, reported three very interesting cases dealing with amnesias in war cases. The cases presented were selected on account of their negative family and personal histories, their average intellectual capacity and the fact that they had all been in active service from six to eighteen months prior to the onset

of their amnesia. The authors consider that while there was an organic element of concussion, the psychic element was the chief factor in these cases. The first patient entered Base Hospital 117 about September 15, 1918, at which time he had a complete amnesia from the morning of April 11, 1918, up to and including October 25. The last event he remembered prior to the onset of his amnesia was landing in Liverpool and marching to the train and the first event following the amnesia was being arrested by some of the military police. Under hypnosis, the whole of the amnesia was cleared up, except for a period of unconsciousness following a concussion which he had received a day or two prior to his apprehension. The patient related the details of his amnesic period with little emotional reaction until he came to the incident of a shell striking a friend in the neck, decapitating him, the shell burying itself in the ground about two feet from where the patient was lying. The patient did not know whether he was more frightened of the friend's head, which was before him, or of the "dud" shell which he expected to explode. In telling of this event, he showed what was no doubt the same emotional reaction as for the actual event, with all the physical and mental manifestations of terror. He stated that after a short time he got up, then another shell came over, there was a puff of smoke and then darkness. He regained consciousness for a short time and found himself about eight feet from where he was first lying. He remembered nothing further until picked up by the police the next day.

The second patient entered Base Hospital 117 July 10, 1918, with a complete amnesia for all events prior to June 10. At this time he remembered being nervous and excited because he could not remember, and complained of headaches which were exaggerated when he tried to think. After earnest efforts for about a week, on behalf of the patient and the physicians, to restore the patient's memory, he was hypnotized. It was then learned that the patient came to France in June, 1917, trained in France and served on the Luneville front. In February while under observation for influenza, he fell in love with a nurse. The nurse was killed in an air raid. The news was a severe shock to the patient and he became very emotional, cried and took no interest in anything about him. After a few days he resumed his normal attitude toward life and did his work efficiently. He was in an air raid about April 25, when he was concussed. He remembered waking in a hospital May 1. He was transferred from one hospital to another and while enroute June 9 stopped at Securingea, where he met some soldiers and began drinking. The following day, June 10, as previously noted, the amnesia

ended. Here, again, the retrograde and anterograde amnesia, surrounding the period of unconsciousness following the concussion, cleared up under hypnosis.

The third case was that of a sergeant, an unusually good type of a soldier, who was concussed about October 8, 1918, and came under the author's observation some time later in October. The patient's first recollection was an incident in the base hospital. At that time he had an amnesia which extended back early in May, 1918, when he arrived in France. The amnesia was punctuated by two islands of memory; the first remembrance, the experience of going into battle July 4, an incident of which he made an autosuggestion never to forget; the second remembrance, an unpleasant experience before his concussion which he wished to forget, in which he gave an order to advance in the Argonne with 140 men, 18 of whom returned. These men he had led and instructed and he knew they liked him. He dreamed each night that the relatives of these men were pointing their fingers at him accusing him of the death of their sons.

In 1921 Harrington cited four cases of head injury. The first was a male, aged fifty-eight, who sustained a fractured skull in a fall. He was unconscious for a short time. He later became incoherent, constantly called for his wife, appeared to have hallucinations of hearing, was greatly confused and disoriented. He gradually improved and was discharged from the hospital eleven weeks following the accident. The third case was a man aged fifty-two years, who sustained a fracture of the skull in a fall January 3, 1910. He had a period of unconsciousness immediately following the injury, which lasted for several days. He was in a hospital for six weeks. On his return home, it was noted that he had undergone a marked change in personality. He became so cross and abusive that it was very difficult for anyone to live with him. He returned to his work but as he became less productive as time went on, it was finally necessary for him to give it up entirely. He then remained in bed all day, became emotional and was destructive. He developed delusions of poisoning and a suspicion that his wife was untrue to him. He became suicidal and it was necessary for him to have institutional care from 1916 until the time of his death about five years later. During his stay in the hospital, he showed impairment of memory and lacked insight. Harrington's fourth case is that of a man aged sixty-one who was struck by an automobile July 5, 1913. No fracture was demonstrated. He was unconscious for a short time following which he became delirious, was confused, irritable and restless. He was disoriented, his memory was impaired for both

recent and remote events, attention was blunted, thought content rambling and he had no insight. From a neurological standpoint, his pupils were unequal and irregular. He had a speech defect, a tremor of the tongue and fingers and exaggerated patellar reflexes. His serological findings were negative.

REPORT OF CASES

*Case I.** The patient, H. T., was twenty-three years of age on admission to Walter Reed General Hospital July 16, 1919. There was nothing unusual noted in his past history. He had been a laborer prior to his enlistment in the army. June 16, 1919, while enroute from Brest to Newport News, he fell down a hatchway, sustaining a fracture of the skull in the right frontoparietal region. He was unconscious for six days. There were no convulsions. He was operated on June 12 when an epidural hemorrhage was found at the site of the fracture. The patient regained consciousness immediately following the operation. He remained in bed for three weeks. He was admitted to the Walter Reed General Hospital July 16, 1919. The X-ray examination showed a rectangular area of bone loss $1 \times 1\frac{1}{2}$ inches in front of the right frontal and about one inch from the sagittal suture. The symptoms, shown throughout the course of his illness, were—headache, dizziness on arising, slight impairment of memory and inability to endure the heat of the sun.

*Case II.** Patient, N. H., was thirty years of age on admission to Walter Reed General Hospital February 3, 1919. His family and personal history revealed nothing unusual as far as obtained. He denied the use of alcohol. He also denied all venereal diseases and claimed to have been well prior to his injury. His occupation was that of a clerk.

On July 19, 1918, while lying on his face in skirmish formation, he was struck by a shell fragment on the head, near the vertex. He was unconscious for six or seven hours, following which he did not notice much pain but had little control over his left leg and arm and had some difficulty in seeing. About eighteen hours later he was operated on and a foreign body removed. The Field Medical Card stated that he had a penetrating wound of the skull and the X-ray reported a foreign body 2×1 cm. in size protruding through the bone at the vertex. A note August 1, 1918, stated that his finger movements were normal but that otherwise he had a complete paralysis of the left arm and a paralysis of both lower extremities, the left complete. His tongue protruded in the midline and there was no restriction in the movement of his back. August 2 it was noted that there was a purulent discharge through the suture hole over the site of entry of the foreign body and that a probe passed in for a distance of $1\frac{1}{2}$ cm. Early in October, 1918, it was noted that the patient knew what he wanted to write but that he could not form the words. The patient began to notice some

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improvement in the movement of his left arm. The wound was healed about November 1, 1918.

He was admitted to Walter Reed Hospital in February, 1919. He complained of having slight attacks of vertigo upon changing his position. He had had no convulsions at any time. Extensive physical and neurological examination showed briefly a slight nystagmoid movement on looking to the right or left. The motor power of the left hand and arm, and the right leg was nearly normal. He abducted and adducted the left thigh fairly well but he flexed and extended poorly. There was scarcely any power of flexion or extension of the left leg on the thigh or of the foot and leg or of abduction or adduction of the foot. The sensation of the left hand and arm was normal. The left chest and body showed a slight impairment to touch, pain and vibration. The left foot and leg showed a much greater impairment but not a total loss. The abdominal reflexes were absent on the left. There was extension of the toes to plantar stimulation on the left and flexion on the right. There was a slight patellar clonus and a marked ankle clonus on the left. The left biceps and triceps reflexes were increased over the right which were normal and the left patellar and Achilles reflexes were much increased over the right which were also slightly increased. The patient was given massage to the left leg and educational walking. An ocular examination revealed normal fundi. There was no involvement of the retinae or nerve heads. Vision was 20/20 bilateral. X-ray examination showed absence of the vertex of the skull from a point two inches above to two inches distally. The occipital bone showed a perforation. Laboratory examinations were negative.

No notes concerning the patient's mental condition were found in the records prior to his admission to Walter Reed Hospital. Here, however, he showed a slight irritability which was not sufficient to involve him in any serious conflicts. The patient complained of some impairment of memory which he believed was improving. His memory span was distinctly below his level of intelligence, being limited to five digits. No other irregularities were noted in his mental processes. The mental age rating on the Stanford-Binet scale was placed at thirteen years. His mental and physical condition improved and he was discharged from the hospital December 18, 1919.

The injury in this case was a perforating wound of the vertex producing a paralysis of the left arm and of both lower extremities. The patient was unconscious for six or seven hours. There were abundant neurological findings. The paralysis of the left leg was complete. The function of the left arm and lower extremities improved greatly under massage and educational walking. The mental symptoms,—the slight irritability and the impairment of memory which was most marked in reference to digits—are not indicative of the presence of any neurotic or psychotic condition.

*Case III.** Patient F. B., a young white male adult twenty-four years of age on admission to Walter Reed General Hospital, February 13, 1919. Family and personal history not obtainable. While

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lying in a shell hole in action about 7 A.M., September 29, 1918, he was hit by a fragment of a high explosive shell, producing a wound in the right occipital region. He was told that he was found wandering about the field after his injury. He was unconscious for several days. About the first thing he remembers was trying to crawl into a dugout one night while in a hospital in France. For a time he could not always understand what was said, nor could he say what he wanted to say. Practically no information as to his mental condition is found in his early records. On October 1, 1918, a portion of bone was removed from the wound. On admission to Walter Reed Hospital in February, 1919, he complained chiefly of pain in his eyes after reading, difficulty in writing, dizziness, weak spells and failing memory. There was a skull defect in the right occipital region. The blood Wassermann was reported negative, Barany test as normal and examination of the eyes as reported: "Vision, right, 20-20, left 20-20. External appearance of eyes normal. Color fields markedly contracted concentrically, and both discs show evidence of old shock, neuritis and pigmentary disturbances in retina and choroid." During his stay in the hospital, he complained of headache, had considerable impairment of memory and ability to associate ideas. He had a slight aphasia, chiefly of the visual type. While on furlough in September, 1919, he tried to help about the farm, making molasses and working in the field. He could only stand working about fifteen minutes, when he would develop headaches, dizziness and nausea, necessitating a rest for an hour or so. The headache, however, would last all day. He was unable to read but for a few minutes at a time. He was discharged as improved on certificate of disability November 12, 1919.

The prominent features in this briefly detailed case are the severe injury to the right occipital region, a period of unconsciousness lasting several days, and a delirium which one might infer had been manifested by a certain amount of cerebral excitement, confusion, motor restlessness reproducing certain activities which had preceded the trauma and an element of fear. The neurological manifestations are indicative of the severe intracranial disturbance originating in this injury. The inability to concentrate upon reading may be explained in part by the existing ocular condition. The headaches, dizziness and nausea initiated by exertion may also be explained upon an organic basis. On the side of the mental residuals, we may place the recorded impairment of memory and the inability to associate ideas, neither of which may be construed as psychotic or neurotic manifestations.

*Case IV.** Patient P. G., was twenty-six years of age on admission to Walter Reed General Hospital April 15, 1919. There were no psychopathic determinants elicited. He had measles, pertussis, chicken pox and scarlet fever in childhood. The records give no definite history concerning his habits or character or the extent of his education. His occupation, however, was given as a teacher in the public schools. He denied the use of alcoholic beverages and all

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venereal disease. He was wounded in the posterior inferior aspect of the left parietal bone by a fragment of a high explosive shell November 1, 1918, while in action in the Argonne. He immediately became unconscious, in fact, had no recollection of hearing the shell explode or of being injured. His first recollection was that of being led back by two comrades. At that time he could see nothing but thought that he walked about one-fourth mile before he again became unconscious. He recalled nothing more in the following eight days except being asked once by a nurse if he wanted to write home. After he became fully conscious, he stated that he felt quite well except for a dull generalized headache which began to disappear after a few days and only recurred, to any extent since that time, when he attempted to read. For the first three or four weeks after consciousness returned, he stated that he could not see but later began to see light and darkness equally in both eyes until his vision gradually improved. He never suffered from diplopia or paralyses. The field medical card stated, under date of November 4, 1918, that the patient had a right homonymous hemianopsia, slight papilledema and was complaining of headache. November 16, it was noted that his vision was gradually improving and November 25 that he could read large print, walk without a guide and did not complain of headaches. A report of the X-ray examination showed a foreign body $\frac{1}{2} \times 1$ cm. above and behind the left ear in the cranium and a small area of bone defect in the posterior inferior aspect of the left parietal bone. A subsequent X-ray examination on admission to Walter Reed Hospital localized the foreign body $\frac{3}{4} \times \frac{1}{2}$ inch in the brain tissue and stated that there was a compound fracture of the left parietal bone. The report of the ocular examination April 19, 1919, showed vision O.D. 20/40, O.S. 20/30; the media was clear, the discs somewhat pale but not suggestive of pathology, the fields showed concentric contraction, which was more marked on the inferior half but equal in both eyes. He had a very severe epileptic seizure with vomiting at 5:30 p.m., May 1, 1919. At 6.30 p.m., the same date, he had a second seizure of similar severity. As far as known, these were the first convulsive seizures that he had ever suffered. He was given a thirty-day furlough and had no seizures during his absence. In the early part of July, 1919, he was described as mentally dull, his speech slow, memory distinctly impaired for recent events, did not even know the date of his furlough. Questions had to be frequently repeated in order to secure an answer. The neurological examination was negative and his chief complaint was difficulty in reading which was not explainable by a refractive error or abnormality of the external ocular organs. An intelligence rating of "A", which is within the upper five per cent of the army, was made July 15, 1919. The patient before being wounded was visually minded and the tests in which he failed were those involving visual imagery. Laboratory examinations, including Wassermann, were negative. He was operated on July 17, 1919, when an osteoplastic flap, two and one-half inches in diameter, was turned down over the foreign body and a dural flap reflected above and behind

its location. The arachnoid was found thickened and slightly yellowish, the foreign body was localized by means of a Hertz compass, removed through the incision and closure made. He convalesced rapidly and was given a thirty-day furlough July 31, which was extended until October 1, when he returned. He stated that he had one severe convulsive seizure August 6 and a light seizure September 20 while he was away. He described an aura which was a sensation of his eyes twitching, followed by blindness; he was nauseated for two or three days following the convulsions. He attempted to do some work on several occasions, while on furlough, but was unable to accomplish anything because of prostration by the heat of the sun. Following any exertion he became weak, dizzy and everything appeared dark before him. The same phenomena occurred if he attempted to exercise in the gymnasium at the hospital. He could not read because the lines became blurred and he was often unable to understand the meaning of a single word. He also had some difficulty in understanding spoken words and when others read to him, it was often necessary to have them repeat phrases or sentences. He stated that he had noticed no difference in his general condition since his operation in July, but complained of pain at the site of the incision. He stated that he had considerable difficulty in concentrating upon the typing he was doing in the occupational department and believed his ability in that respect was becoming more and more impaired. He had one more epileptiform seizure, lasting five minutes, at 10:30 A.M., October 22, 1919. He was later discharged upon a surgeon's certificate of disability.

In this case a shell fragment caused a penetrating wound, with compound fracture, in the posterior inferior aspect of the left parietal bone. Excepting the recollection of a brief period during which he was being led back to the lines, and another relating to the nurse's suggestion that he write home, the amnesia of eight days' duration is complete. This includes the explosion of the shell, the actual injury and the period of unconsciousness as well as a considerable time during which the patient reacted to the environment. With the return to more complete awareness, the patient experienced a dull generalized headache. There was total amaurosis which may in part be explained by the papilledema and hemianopsia. Some six months subsequent to the injury, there developed two epileptiform seizures accompanied by vomiting, the attacks being less than an hour apart. About eight months after the injury, an intelligence rating of "A" was made. A few days later the foreign body was removed. In the ensuing three months, the patient experienced three mild epileptiform attacks, each of which were preceded by an aura. He appeared dull, his memory for recent events was somewhat impaired and his speech was slow. He complained of blurring vision, inability to concentrate, weakness and dizziness following exertion and exposure to the sun. He also had sensory aphasic difficulties, frequently being unable to understand written or spoken words.

*Case V.** The patient L. J., was born in South Wales, September

* Used through the courtesy of Walter Reed General Hospital.

23, 1901. No history of mental or nervous disease in the family. He had a few of the minor illnesses of childhood but denies venereal diseases and the use of alcoholic beverages. He attended school from the age of seven to thirteen and thinks he made normal progress, had no especial difficulties in learning, and gave no history of truancy. He worked around water fronts and on boats as a sailor after leaving school and came to America in 1916, being at that time about fifteen years of age. He did a common laborer's work until he enlisted in the Army in June, 1920. From his statements it appears that he was a normal boy and of normal intelligence prior to his head injury. While guarding warehouses at Camp Grant, Ill., October 10, 1920, he was struck by a bus which knocked him down. He was unconscious when he arrived at the hospital where a diagnosis of fracture of the base of the skull was made. The patient was described as being unconscious or delirious for three weeks, at times comatose, at other times delirious, requiring restraining sheets to prevent him from falling out of bed. He began to regain consciousness after about three weeks and improved mentally. The following is a copy of the summary of his condition prior to his transfer to Walter Reed General Hospital, August 1, 1921:

"All deep reflexes are present, active and equal. His abdominal reflexes are very faintly present but easily exhausted. There is a faint response from the right cremasteric. Left plantar stronger than the right. There is slight swaying in the Romberg position. He has no Babinski, clonus or other pathological reflex. He has a slight speech difficulty in pronouncing certain words. He is inclined to hesitate and stammer when excited. He has a partial paralysis of the right facial nerve. He is almost deaf in the right ear and has coarse tremors of the protruded tongue which has a tendency to deviate to the left. His pupils are central and regular, the right being slightly larger, both reacting to light and accommodation and moving freely in all directions. This patient has evidently suffered a let-down in his mental capacity. It is true that at this time we have only a cross section of this man's mental status; but from a careful inquiry into his past history one would be led to conclude that he has not the same mental capacity that he had before his head injury last October. At the present time he is apparently unduly irritable, is childish, simple and light-minded. He lacks ability to concentrate, to think quickly and accurately and his retention is markedly deficient. He impresses one as being rather stupid, his replies to questions show simplicity and he has no definite or well set plans for the future. When asked what he intended to do when discharged from the Army, he replied, 'Go home.' He apparently had no thought of how he would get home. He has been in the hospital nine months and has saved none of his pay. He was given several mental tests and in all of these, he showed loss of emotional tone; he easily became mentally fatigued and confused to such an extent that he could not accurately do simple sums in addition and subtraction and could not repeat simple sentences without error. He says that he becomes nervous and does not know what he is doing.

He has insight and realizes that there has been a change, both in his mental and emotional make-up. He says that he cannot think or remember as well as he formerly did. He denies any speech defect before his head injury. His reactions in general are simple and childish. His judgment is faulty. He says he has a \$35,000 suit against the ——— Bus Company, but he shows lack of interest and has not attempted to push it as a normal person should do. He says he could no longer be a sailor because he gets so nervous and when he stoops over he can feel the blood flow to the right side of his head." The transfer diagnosis was "Traumatic Constitution."

On admission to Walter Reed Hospital the history of the accident was obtained as previously given. The patient stated that for one week after regaining consciousness he could not talk and was told that he had a fractured skull and since that time he has been very nervous and easily excited, so that he was afraid to go on the street alone, and it was observed that he became very nervous if there was any trouble on the ward and said that he must get away. He knew that he could not be cured; that the right side of his face was paralyzed; the right ear deaf; vision of the right eye poor, he could only distinguish between light and dark; his right arm and left leg were weak; the latter pained him when he sat down but did not bother him when he walked. He was quite satisfied in the hospital but would rather go to school. He said that he was treated well, slept well and liked the food and had had no trouble with the other patients upon the ward. A summary of his mental status August 15, 1921, showed that the patient was attentive and answered questions intelligently and promptly; his stream of talk was free but a marked hesitancy was noted in his speech; emotionally, he was about normal, denied having had hallucinations or delusions, was well oriented, memory for remote and recent events good, special memory tests well performed, Masselon, Ziehen and Finckh tests not answered, months and numbers given correctly forward and backward, current events well remembered, simple calculations well answered and ethical questions answered properly.

Laboratory examinations: urinalysis, negative; Wassermann negative; X-ray: right lateral stereo of the skull showed no definite signs of fracture, right antrum was dull and the ethmoidal region less radiable than normal, the remaining accessory nasal sinuses appeared clear. The ear, nose and throat clinic reported an "otitis interna, chronic, nonsuppurative on the right. Hearing: right, 00/00, left 20/20." The eye clinic reported, "Vision: O.D. 20/50, O.S. 20/2 plus 3, O.S. cornea shows an old leucoma causing the impaired vision of that eye. Fundi: Discs are rather pale in temporal halves but hardly sufficient to permit the statement that there is an old neuritis. Visual fields are concentrically contracted though equally so. No signs of any destructive lesion intracranially from ocular examination."

A note December 30, 1921, stated that the patient was ordinarily quiet but became quite irritable at times. He was childish and simple but showed no depression or elation. His thought content showed no

delusions or hallucinations and his insight was good while his judgment was quite defective. Intelligence tests were poorly done and he was only able to do simple calculations. After any little mental effort he became fatigued and his mistakes were much more noticeable. During his stay in the hospital, the patient showed no conduct disorders.

The description pictures this patient, following the concussion, as unconscious and either comatose or delirious for three weeks. The delirium necessitated restraint. From this, it is inferred that the patient evidenced considerable confusion, restlessness and cerebral excitement. The residual manifestations are,—irritability, periods of excitement and confusion, lack of interest in, or plans for the future, childishness and simplicity in his reactions and mental processes, lack of insight and faulty judgment, a hesitancy in speech, inability to concentrate, mental fatigability and perhaps intellectual impairment.

*Case VI.** The patient G. J. G., in whose family no psychopathic antecedents were elicited, was twenty-nine years of age on admission to Walter Reed General Hospital, March 17, 1919. He had scarlet fever in childhood but no other serious illnesses, convulsions or injuries. The clinical records of this officer do not state the grade of education reached but, inasmuch as his rating was 129 in the army intelligence test which is above the average for army officers and as his occupation was given as a physical and military instructor, one might safely conclude that he was well educated and that he had made a good adjustment in life. He denied the use of alcoholic beverages and all venereal disease.

July 15, 1918, while in action near the Marne River, he was wounded by a fragment of a high explosive shell, just outside the outer canthus of his left eye, in the left foot and in the left arm. He believed that he was conscious for about thirty minutes, during which time he bandaged his wounds and recalled having been blown off his feet after attempting to arise. He had a weak, numb feeling and was unable to stand. He recalled nothing further until about noon the following day when he was picked up by some Germans. He stated that for several weeks he was very ill, dazed and not very clear in his recollection of the events transpiring during that time. He remembered meeting another officer of his regiment and some of the men from his own company about four weeks following his injury but at that time he did not recognize them. He was up and about on crutches the latter part of August, 1918, and was released December 1, 1918. He was returned to the United States January 27, 1919, and was operated on at Cape May the latter part of February, at which time a shell fragment 3 x 1.5 cm. was removed. He did not know whether the shell fragment was inside or outside of his skull, but he was told that it was imbedded in the bone. He complained of a continuous headache until the shell fragment was removed; since that time the headache recurred only at intervals. Throughout the course of his illness he has had a sensation of dizziness, especially

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after getting up quickly. He has had difficulty in choosing the correct word, selected it after considerable delay or used the wrong word. He has been able to read but found it difficult to concentrate and afterwards could not recall what he had just read. He easily forgot minor appointments, was extremely nervous, restless and any excitement seriously disturbed him. During periods of excitement, he complained of severe pain in his head. In the early part of his illness he had frequent attacks of numbness in his hands and feet but never suffered motor loss.

A survey of the physical examination made on admission to Walter Reed General Hospital indicated that his general physical condition was good. His respiratory, circulatory, gastrointestinal and glandular status was negative. There was no external evidence of genitourinary disease except for a left varicocele. There was subjective impairment of olfaction; he perceived the odor of lemon, peppermint and asafetida much more acutely in the right nostril than in the left but the pungent effect of ammonia in the left better than the right nostril. There was no impairment of vision in the right eye but he could see only light and shadow in the left. The pupils were circular and centrally located, the right reacted normally to light and accommodation, the left reacted stiffly to light but fairly to accommodation; the left pupil reacted to light directed to the right eye quite well but the right pupil showed scarcely any reaction to the light directed to the left eye. There was no diplopia or nystagmus. Otherwise, no cranial nerve abnormalities were noted and further neurological examination, except for a slight tremor of the extended fingers, was negative. A report of the X-ray examination stated: "A portion of the anterior wall of the left frontal sinus is missing, medially to this, the left frontal sinus is definitely hazy. There has been a fracture of the left frontal bone and the frontal process of the left malar bone, with union in malposition and callous encroachment on the orbital contents." Urinalysis and serological findings were negative.

A psychological examination showed an apparent normal function of the mental processes with the exception of his memory ability which was below normal for his level of intelligence. In his memory for digits and sentences, he failed tests usually passed by individuals of a ten-year mental age level and it was thought that his ability to form new associations was affected.

There were no further notes of especial interest made until February 9, 1920, at which time it was stated that his general condition had improved. He complained of constant pain in his head which at times became quite severe; he was easily mentally upset, worried over trifles, and was constantly brooding over his possibilities as to the future. In April, 1920, it was noted that the patient was usually prostrated for several days after he attempted to do any work requiring exertion or mental application. The dull pain, of which he complained, was thought to be partially explainable on the basis of a possible chronic pachymeningitis resulting from the old injury. He continued to worry over insignificant things and at times

became prostrated over some imaginary harm which might befall his brother. It was thought that further hospital treatment was unnecessary and that improvement would be more rapid if the patient could be discharged with total disability in order to relieve him of unnecessary worry in regard to the future. He was accordingly discharged May 10, 1920.

The above injury, directed to the outer canthus of the left eye, produced a fracture of the left frontal and of the frontal process of the malar bone. There was a short period of unconsciousness, following which he was dazed and confused. Throughout the course of his illness, he complained of headaches, dizziness on quick changes in his position, difficulty in concentration and a handicap in the selection of proper words. He was forgetful, restless, irritable, excitable and emotionally unstable. He manifested marked mental and physical fatigability and worried over such things as his prospects for the future and some vague harm that might befall his brother. The intelligence rating prior to his injury in this case was most fortunate. According to the army tests, his rating was 129, which is above the average for army officers. About one year following the injury, the chief defect was in the field of memory where he failed in tests usually passed by an individual of the mental age of ten years.

*Case VII.** The patient G. J., was born May 21, 1892, in Dublin, Ireland. His father died by accident at the age of thirty-five and his mother of pneumonia at the age of thirty-two. One brother died of pneumonia and he has four brothers and one sister living and well. He stated that he had measles, mumps, scarlet fever, diphtheria and chickenpox during childhood; malaria, typhoid and influenza since enlisting in the army. He denied venereal diseases, the use of alcoholic beverages to any extent and abnormal sexual desires or perverse cravings. He came to this country at the age of eight. He stated that he always got along well with everyone and was normally interested in the usual boyhood activities. He was unable to give accurate dates but said that he attended school only five years and reached the eighth grade. He worked as a teamster for five or six years and "filed saws" for about three years. He was not sure about the date of his enlistment in the army but thought that it was about February 8, 1915; however, a note on his clinical record gave his tropical service as nine years which would indicate that he had enlisted prior to the above date. He denied having had any court-martials or conflicts with the civil authorities. The notes in the clinical record show that he was admitted to the Station Hospital, Plattsburg, N. Y., July 16, 1921, in an unconscious condition with the history from an accompanying soldier that he had been in an automobile accident. There was bleeding from the nose and mouth, his pupils reacted to light, but were unequal. For about the first three days, the patient apparently remained in a state of coma with an accelerated pulse. On the fourth day, it was noted that the patient reacted somewhat to stimuli, in that he responded to verbal directions to open his eyes and turn over. On the sixth and seventh days,

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he was noted as still unconscious, his pupils unequal, that he had not regained control of his sphincters, but that he responded to verbal directions better. On the eighth day some improvement was noted, speech had returned but was slow and unmeaning, and he began to have more control over his sphincters. On the tenth day he was described as "more restless," and on the fourteenth, July 29, 1921, he seemed much brighter and almost wholly conscious. The next note is dated September 8, 1921, and reads: "The pupils are equal and react to light. There is a partial paralysis of right hand, arm and leg, with some interference in speech. General physical condition good, eats and sleeps well. The patient finds difficulty in walking in the dark and his coördination seems much impaired. At times he says that there is a cloud over his brain, and he is confused. Full control of bladder."

The patient was admitted to Walter Reed General Hospital October 15, 1921, at which time he stated he was unconscious for eleven days, was unable to use his right leg or arm for five weeks, and after regaining consciousness could not see out of right eye, but that this condition had improved until vision seemed normal to him. He complained of pain in the right popliteal space, severe headaches lasting for about fifteen minutes and pain in the back of head which extended from the occipital protuberance to the left mastoid region. He stated that he did not remember going out the night of his injury or what he did that day, nor did he remember events well until about October 1, 1921. It seemed, up until this time, as if he had been in a sort of a dream. He was told that he and some of his comrades went out in his car. On the way back to camp, a comrade was driving the car and made a bad turn which caused the accident. He stated that it was very peculiar that he remembered no events of the day before the accident. He was told that he was unconscious eleven days and the first thing he could remember was waking up with a sensation that his stomach was paralyzed and he had no control over rectal or vesical sphincters. He has another faint recollection, which must have been a dream, following this, of imagining that he was in a car with someone who was driving straight into the river; he tried to warn the driver but it was too late, and he found that he had urinated in bed. A comrade later told him that he had cried out, "You haven't a bit of sense, you're driving right into the river." He was told that after he began to get restless, he kept trying to get out of bed and had to be restrained, otherwise he would wander around in his pajamas or go out into the street and that one night he "raised Cain" and threatened to "clean up" the ward. A comrade, a patient who was in bed nearby, stated that on this occasion the patient was quite excited and believed it was about August 1. This comrade further stated that the patient lay in bed very quietly for about the first ten days and, then, he was restless for several days and kept asking the doctor, whenever he came through the ward, if he might be allowed to go on duty, when it was quite necessary for him to be watched on account of wandering out on the street. He was also quite "absent minded" as he would

go to the canteen for cigarettes and matches, forget what he went after or perhaps only bring back the matches. Upon the ward, the patient spent a great deal of time by himself, did not associate much with the other patients, and might usually be seen in a corner of the ward. He slept a great portion of the time and stated that he used to sleep all the time. On October 17, 1921, the Wassermann of the blood serum was found negative. The same day the ear, nose and throat clinic reported no pathology found and hearing, right and left, was 20/20. The report of the eye examination October 18 read: "Patient complains of diplopia, slight exophoria, bilateral. Vision: O.D. 20/15, O.S. 20/20. Fundi, right disc shows rather pale background compared with disc upon left. Visual fields O.D. are somewhat contracted." On October 26, patient complained that he had been seeing two, three or even four images at a time and that his right eye was poorer than the left. The X-ray examination showed that there was an area of increased radiability in the vertex which had the appearance of thinning of the bone. There was no evidence of radiating fracture lines in this area or depressed fragments. The findings were not suggestive of a fracture of the skull. In December, 1921, it was further noted that he still showed considerable interference in his speech, his stream of talk was meagre, stumbling and slow, but relevant, coherent and spontaneous. Emotionally, he appeared somewhat disinterested, restless and irritable, the latter especially after being questioned for a little while. He said that he wanted to be alone where there was no noise and liked to get out doors where it was quiet. When he heard an automobile horn he became excited and confused, jumped and might start in any direction, said that he jumped into a tree, the other day, on this account. He denied all ideas of reference or persecution. No hallucinations were elicited. Had, however, lost confidence in himself and feared if he walked too far from the post he might get lost or something happen to him; was afraid to go down town, although he had soldiered in Washington a year, as the town looked strange to him and he might lose his way. It would appear that he had considerable insight as he said his mind was not as good as it used to be; his memory was poor and he realized that he had been "slowed up" and there had been a change in his disposition. He said he was formerly quite lively and "took in everything." He did not believe, however, that he was "crazy," but he once thought he might lose his mind. He was oriented, memory poor, special memory tests entirely inadequate, backward associations poorly done as well as simple calculations. Physical examination at this time was practically negative except for some facial asymmetry. The right side was fuller and smoother than left. He could not pull right corner of mouth to right. Could not open left eye and close right at the same time. The deep reflexes of the right arm were exaggerated and greater than the left. He had a subjective feeling of slight general weakness and the sensation of jerking in his right arm when he attempted to write. The character of his writing was poor, tremulous, and almost unreadable. His method was slow, laborious, and he complained that it was diffi-

cult for him to think how to spell. He read printed matter fairly well aloud but had difficulty in expressing the meaning of what he had just read. When called upon for an explanation as to why he could not recall a few lines he had read aloud, replied, "Thinking makes me have a sleepy headache, besides I get all mixed up."

In this case we have a patient who had apparently made a satisfactory adjustment considering his intellectual level. Following concussion, he was unconscious for about eleven days. As consciousness reappeared, speech was observed to be "slow and unmeaning," there was a gradually increasing motor restlessness which necessitated restraint and an excitability culminating in an explosive reaction in which he expressed the intent of attacking all the patients upon the ward. Whether this was a reaction of irritability or a reaction to ideas of a delusionary character in his state of confusion is problematical. Relying upon the facts as known, the reaction with the physical restlessness and cerebral excitement might perhaps be called a delirium. That he had a total lack of appreciation of the situation is evidenced by daily requests to be reported for duty, even while constant supervision was necessary. The neurological manifestations in this case,—the interference in speech, partial paralysis of the right hand, arm and leg and the impairment of vision, diplopia, pale discs and contracted visual field on the right—are indicative of micro-structural changes in the brain. The retrograde amnesia of one day, and the almost complete anterograde amnesia of seven or eight weeks are extremely interesting from the standpoint of psychogenesis. It is to be remembered in this connection that he was injured while out joy-riding with a comrade, who was driving his car, and that one of his earliest recollections was a dream in which he was being driven into the river by a reckless chauffeur, following which he awoke to find that he had voided urine in the bed. The superficial significance of the dream is of course obvious. The residual symptoms are,—seclusiveness, irritability, especially to acoustic stimuli, restlessness, physical and mental fatigability, vocopsychomotor retardation, emotional instability, some intellectual deterioration, fear of getting lost and fear and confusion upon hearing the honk of an automobile horn.

*Case VIII.** The patient A. J., was thirty-one years of age on admission to Walter Reed General Hospital, February 20, 1920. No psychopathic determinants elicited. Very little information was obtained concerning his personal history. He had attended school about four years, completing the fourth grade at the age of eleven, and he was employed as a storeroom keeper in an electric light plant prior to his enlistment in the Army, in 1917, where he was promoted to the grade of corporal. He denied all venereal disease and the excessive use of alcoholic beverages. He had typhoid fever, the date of which was not ascertained.

He was wounded by a high explosive shell, which, he stated, he saw strike the ground about five feet from him on September 12, 1918, at 10:00 A.M. The field medical card stated that he became

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unconscious about five minutes following the injury and was unconscious for seven or eight days. The patient had an amnesia until sometime in November, 1918. A note on the field medical card September 13, 1918, stated that he had a through and through wound with a compound comminuted fracture of the left parietal and frontal bones. Loose fragments were removed and considerable maceration of the frontal lobe was noted although there was no great amount of hemorrhage from the brain substance. There was drainage over the brain tissue. X-ray showed the fracture in the vicinity of the left parieto-frontal articulation with radiating fracture lines. A note September 20 stated that the patient answered some questions rationally and a patient in an adjoining bed said that he had asked for cigarettes, matches and called for a magazine. He had a paralysis of the third nerve, left, external strabismus, and a slight left facial paralysis. He fed himself with ease, had no paralyzes of extremities and his reflexes were normal. September 28 he complained of severe headache and the following day the wound was reopened and dressed. A suppurating tract was found along the frontal bone, and there was a discharge of cerebrospinal fluid. He was talking at this time in a fairly rational manner and he had no difficulty in walking. A note October 15, 1918, stated that there was considerable mental improvement, could read words but apparently did not understand their meaning. October 18 it was stated the wound had approximately healed but the patient was "mentally ineffectual." A note December 16, 1918, stated that the patient was unable to give any information concerning his injury. He complained of sharp pain through the left forehead. His gait and station were good. The right pupil reacted well to light and accommodation but the left did not react to either and there was internal and external ophthalmoplegia and strabismus. There were no bulbar symptoms. Some degree of incoordination of upper extremities as shown when he tried to touch his nose with the tip of his left index finger and his right leg with the left. The right leg disturbance was not as marked as that of the left arm. There was slight facial and auditory involvement but no further sensory impairment. The patellar and Achilles reflexes were equal on both sides, the abdominal and cremasteric were absent on the left. Mentally, he appeared very dull, was slow to understand questions and in responding to them. He was partially disoriented and his memory was especially poor as to past events. His articulation was fairly good, although some sensory aphasia was noted in that he used the wrong word at times, as for example, he said "bitter" when he intended to say "sharp." December 22 it was noted that he spoke in a monotone, showed profound lack of emotional responsivity and considerable impairment of spontaneous speech. He had difficulty in naming objects and understanding spoken words as shown in his failure to carry out simple commands promptly. He read figures, letters and words but did not appear to understand them completely. He also showed hesitancy in carrying out written commands, gave a very poor account of a sentence he had read and no account of selection. There was paraphria for all but simple

words, but he wrote a good sentence spontaneously. There was apparently less impairment of motor word memory than auditory. No real astereognosis or apraxia. He was unable to compose the simplest words when the letters were spelled to him. He had no appreciation of absurdities and showed a paucity of ideas. The type of aphasia was described as "word deafness with implication of spontaneous speech and elaboration, with paraphasia, paragrammia and echolalia."

Very little change was noted in his condition on admission to Walter Reed General Hospital February 20, 1919. The wound was healed, there was the skull defect as noted and blindness of the left eye. A report of the X-ray examination was to the effect that the right side of the skull showed a comminuted fracture of the frontal bone extending to the frontal sinus. A small metallic foreign body appeared to be in the brain substance. The left side of the skull showed a comminuted fracture of the frontal bone extending to the coronal suture. There was a loss of bone substance $1\frac{1}{2} \times \frac{1}{2}$ inches and numerous small bone fragments were seen. Laboratory examinations, including the Wassermann reaction, were negative. No additional factors concerning his mental condition were noted until November, 1919, except that he had appeared to be quite confused at times. June 24, 1919, the lower third of the scar was excised and skull defect exposed at the lower angle. The sinus was not traced and no sequestra were found. There was some escape of cerebrospinal fluid and a closure was made with drain and an uneventful recovery ensued. In July, 1919, a neurological examination was about as previously noted. The left ophthalmoplegia was incomplete, internal and external. There was paresis of the left facial and hypoglossal, left optic atrophy and tinnitus of the left ear. An intelligence rating was placed at ten years. A summary of extensive tests for the aphasia showed that the connection between the visual and motor centers did not show much disturbance but considerable disturbance was noted between the auditory and motor centers, either spoken or written. The chief symptoms were irregular difficulty in comprehension of spoken language, paraphasia and perseveration. All the symptoms increased during effort, implying that the chief difficulty was associative. A cranioplasty was performed August 5, 1919, from which the patient made an uneventful recovery, and he was given a thirty-day furlough in September. In October and November he complained of headaches but was attending school. November 20 he was noted as being disturbed and very irritable. At such times his face was notably flushed. He appeared less dull, and in December stated that he could study sometimes but at other times his efforts were not attended with success. His headaches lessened. In February, 1920, he complained of dizziness at times, was unable to keep his mind on his work, appeared to be much improved emotionally although he continued to be somewhat irritable. In April he was improved considerably from an emotional standpoint, was troubled very little on account of irritability, appeared to be quite cheerful, took considerable interest in his activities and began to ask for his discharge. He was discharged as improved on a surgeon's certificate of disability June 8, 1920, with a diagnosis of "Old

Fracture Compound Comminuted of Skull, left Fronto-Parietal region, producing laceration of left Frontal lobe, with resultant aphasia, Third nerve paralysis and Mental Impairment."

Here we have a "through and through wound" with a compound comminuted fracture of the left parietal and frontal bones producing considerable disorganization of the frontal lobe. The patient became unconscious five minutes subsequent to the injury and remained so for seven or eight days. The amnesia extends, from the moment consciousness was lost, throughout a period of about two months. The early neurological manifestations were,—paralysis of the third nerve, on the left, with internal and external ophthalmoplegia on that side, strabismus, left facial paralysis, some dyspraxia of the upper extremities, impairment of hearing and aphasia. On the mental side, he evidenced,—confusion, disorientation, some irrelevancy, a lack of appreciation of the situation, impaired memory, dullness of intellect, a paucity of ideas and no perception of absurdities. The type of aphasia was described as "word deafness with implication of spontaneous speech and elaboration, with paraphasia, paraphraphia and echolalia." Several months later it was noted that his chief aphasic symptoms were increased during effort, implying that the chief difficulty was associative. His headaches lessened with time and his mental condition improved. He continued to have, however, great difficulty in concentrating upon his work and evidenced emotional depression, instability and irritability. He had several explosive reactions in which he was quite disturbed. At such times there were marked vasomotor disturbances. Ultimately, at the time of discharge, eighteen months after the injury, he had improved from an emotional standpoint, was quite cheerful and was troubled very little by undue irritability. He was taking a great interest in his activities and showed considerable intellectual improvement.

*Case IX.** The patient R. R., was born in Ohio in 1900. There was no history of mental, nervous or chronic wasting diseases elicited in the family. The patient did not remember any illness prior to 1916 when he had pneumonia, he had influenza in 1919, a tonsillectomy in 1920, but denied all venereal diseases. He denied the use of alcoholic beverages and habit-forming drugs. There was a history of a fracture of the left leg from a fall from a horse in childhood but he disclaimed all knowledge of this. He claimed that he could not recall any events connected with his life as a child and was unable to give the age at which he began school. He was attending night school when he enlisted in the army and was working during the day in a garage, which work he enjoyed, however, he could offer no information concerning the period of time he had spent at such work. He considered that his home life was pleasant and that he had gotten along well in the fourteen or more months he had been in the army and that he had been treated well by all.

On October 11, 1920, while walking through a park enroute to his station at Fox Hills from a theatre at Stapleton, Staten Island, he was knocked down, presumably by a sailor whom he had reported for stealing blankets. He did not see the sailor but civilians who

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picked him up said that they had seen two sailors running away. His clothes were muddy and there was a swollen area the size of a walnut on the top of his head. There is no history of nausea, but his nose was bleeding. The last thing he remembered was walking through the park, the next, being supported by some civilians because he felt weak and dizzy. He was carried to the hospital by some soldiers, where he was kept on duty status. He had no work to do, except to watch property in an empty ward, but he had a headache and continued to feel weak and dizzy. On October 22, 1920, he was transferred to Walter Reed General Hospital for duty where he reported on sick call the following morning. The admission note stated that he showed a peculiar mental condition, slept a greater portion of the time, that it was very difficult to obtain any information from him, that he complained of blurring vision, was weak, brooding and melancholic, dull and stupid, occasionally blew clots of blood from his nose in the morning and had been losing weight since the injury. He appeared to be an intelligent individual and it was considered that he might have been malingering. On November 1, 1920, it was noted that the patient was quite confused, poorly oriented in all spheres, talked in a slow, rambling fashion, stimuli apparently aroused impressions but responses were expressed with considerable difficulty, seemed dull and depressed but this was considered largely the result of his confusion, his attention was hard to hold and his memory was impaired for both recent and remote events. There were no delusions or hallucinations elicited and all intelligence tests were inadequately performed. A mental examination, November 9, 1920, found him to be oriented for place, he gave the approximate date but knew only one patient upon the ward. He said that his mind was all right, that there was nothing wrong with him and he wanted to return to duty. Emotionally, he appeared depressed, frequently sighed and tears came into his eyes when he said he thought a sailor was after him and was going to get him. No other delusions elicited. He heard voices at night, a sailor talked to him, saying that he was going to get him. The sailor also laughed at him. He was retarded in speech and movement, his attention was hard to gain and he could not repeat six digits forward. There were islands of memory for both past and present events; however, he could not recall his mother's name, where or why he enlisted in the army, except the date of his arrival at Walter Reed Hospital, could not recall what he had had to eat for the last night's meal and was unable to recall the address given for him to remember after three minutes had elapsed. He responded poorly to the Masselon, Ziehen and Finch tests. Simple sums in addition and subtraction were incorrectly performed. A summary of the neurological examination of the same date shows that the pupils were equal and reacted to light and accommodation. No disturbance of the cranial nerves. No tremors or ataxias, no disturbance in station or gait, no speech defect, no atrophies or paralyzes, no areas of hypoesthesias or hyperesthesias, and the deep and superficial reflexes were found normal.

(To be continued)

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, APRIL 20, 1922, DR. F. H. PACKARD,
PRESIDENT, IN THE CHAIR¹

SOME OBSERVATIONS ON THE CHEMISTRY OF ADRENALIN

Dr. J. C. Whitehorn said that although the principal results secured since the resumption of activities in the chemical laboratory are not yet ready for publication, he would report a few minor observations on the chemistry of adrenalin.

1. Adrenalin in strong concentrations gives a violaceous red color with the reagents customarily employed in testing for tryptophane or its derivatives, *i.e.*, concentrated sulphuric acid and vanillin or formaldehyde. This is of interest because it suggests a possible metabolic relation between adrenalin and tryptophane, and therefore makes desirable adrenalin studies in such conditions as pellagra.

2. Neutral formaldehyde, which inactivates adrenalin physiologically, has the chemical effect of almost, if, not quite, destroying the basic character of adrenalin.

3. A new oxidative color reaction by means of silver peroxide has been found to be several times as delicate as the Ewins reaction. The silver peroxide is prepared by mixing equal volumes of $n/100$ silver nitrate and 2 per cent potassium persulphate. When 0.25 cc. of this freshly prepared suspension and about 3 cc. of a dilute adrenalin solution are mixed, the addition of 3 to 5 drops of ammonia water gives a pink color, which increases in intensity for 4 or 5 minutes and then begins to fade.

Discussion: Dr. Otto Folin said this is a very difficult subject to talk about as Dr. Whitehorn, himself, manifestly realizes. It is an obscure problem which some day will be solved. He referred to the determination of either the amount of adrenalin or the amounts of decomposition products of the same found in the blood. No doubt in time the amount of adrenalin will be determined as now a great many other products in the blood are determined.

A PSYCHIATRIC INDEX FOR FACILITATING STUDY OF PREVIOUS RECORDS

Dr. S. M. Bunker said the object of the psychiatric index is to promote a larger use and research of the psychiatric hospital records. The index essentially consists of some hundred psychiatric symptoms

¹ Communications from members of the staff of McLean Hospital, Waverley, Mass.

selected as chiefly characteristic of the more common psychoses recognized to-day. Graph paper gives an opportunity to check in chronological sequence the presence or absence of those symptoms in the development of any particular case. The case record system has been developed at the expense of considerable labor and money in the general hospitals. To-day there is a far greater use of the case records in the general hospital than in the psychiatric hospital. The symptom index is not a new idea. On the contrary, it has been found useful at the Danvers and Rhode Island State Hospitals. The present index has been especially modified to serve as a key to past records at the McLean Hospital. It shows the trend of the psychoses and stimulates interest in the chronic case. It is made elastic by providing for admissions of symptoms peculiar to the particular case under study, thus lending itself to the analysis of the individual case. Card index files are made from the symptom index which is filed with the case record. The consistent use of the symptom index in time would present several worth while possibilities. (1) It offers the basis for a dictionary of psychiatry. (2) It provides a quick and scientific method of presenting cases of like symptomatology at staff conferences. (3) It accepts Kraepelinian terms at their face value, thereby laying a fair basis for the criticism of the whole Kraepelinian school. (4) It encourages the students of psychiatry and psychology at our universities to consult the original records rather than to depend on textbook theories. It is not a statistical study, but is designed to unlock the accumulated records of the past and make them accessible to the student of to-day.

Discussion: Dr. H. I. Gosline said he had been working on this subject since 1914. He was familiar with the symptom index as used at Danvers State Hospital. Regarding the making of the first record, when he was at Danvers, it was made by the assistant superintendent before the patient was brought to the clinic. At the Rhode Island State Hospital at Howard it is made when the patient is in the clinic. He considers the Danvers method preferable because there is more time to do it. As to who should have charge of these records, it seems to me that such work would come under the clinic director, if the hospital has such a member. In some hospitals the same person is clinic director and pathologist but this is unsatisfactory unless this individual has numerous assistants. Among these assistants there should be a statistician. There is definite need for a statistician in a hospital of 1400 patients, for many reasons.

In the Worcester State Hospital in 1915 he used this idea about filing by symptoms instead of by patients. There were 1200 autopsies in the records and he had completed 400 when he left, thinking they would be valuable in making correlations with the anatomy and pathology when it is known what these mean.

The symptom index as used at Howard is not quite satisfactory and some modifications have been made recently. A point about psychopathology is that psychiatrists either do not know enough about psychology or psychiatrists have not used what is known by the psychologists. Perhaps the psychologists have the knowledge,

but not enough has been learned about it to use it. In making the new classification at Howard he has tried to arrange the psychopathological symptoms as to whether the primary mode of appearance is in the perceptual or edeational sphere, the sphere of inner states, or the sphere of activities. They have even gone farther than that and have tried to decide as to whether the symptom is in the perception of concrete objects, in the perception of time or space or of measuring, if the ideas are defective, whether the defect is of memory ideas, of imaginative ideas or of general ideas. Another advance that might be made is to separate the physical, mental and social aspect in making out histories. They are trying to find out more about the mental and social characteristics of the forbears as well as the patient so that when the summaries are made out there may be a summary of the mental history and then the mental examination, a summary of the physical history and the physical examination. They may have a summary of the social condition but not a social examination. Perhaps in the future there may be some way of making a social examination. In approaching the social side he has found McDougall's "Social Psychology" most serviceable. Münsterberg's arrangement in his "Psychology, General and Applied" has made it possible to group the mental symptoms, according to psychological categories.

Lastly he would criticize the grouping of hallucinations and illusions together. They are different and probably fundamentally so.

REPORT OF A CASE OF ADDISON'S DISEASE WITH PSYCHOSIS

K. J. Tillotson presented this case: The patient, a single woman fifty years of age, a housekeeper, beginning September, 1920, developed Addison's disease. The case was interesting in its typical progression and its presentation of all of the classical symptoms of the syndrome. One year following the onset of the physical symptoms a depression set in which had considerable involuntional coloring. The disease progressed to an acute hallucinatory episode which was followed by months of a confused, inaccessible period ending with sudden and practically complete disappearance of all psychotic symptoms, but with slight associated physical improvement. There was nothing pathognomic in the case and it was reported as an exceptionally complete clinical picture of Addison's disease and because the literature contains few descriptions of the association of Addison's disease with psychosis.

REACTION TIMES AS AN INDICATOR OF EMOTIONAL DISTURBANCES IN MANIC-DEPRESSIVE PSYCHOSES

Dr. Helge Lundholf presented this paper:

Simple reaction times to sound stimuli were taken on twelve patients suffering from a manic-depressive psychosis, the readings being made two times a week for periods of four to seven months.

Ten reaction times were taken every day of experimentation and averages and standard deviations calculated. At the same time the doctors' observations of the patient were carefully recorded. The experiments show that an increase of the averages and standard deviations of the readings of a single day of experimentation and also an increase of the averages of averages and standard deviations for a period occurred as soon as a patient went into a manic excitement. The changes in the reaction times appeared in four out of six instances previous to any noticeable changes in the conduct on the ward, and consequently, the onset of the excitement could be predicted on the basis of the laboratory records. In a few cases of hebephrenic dementia praecox the characteristic finding was an absence of congruity between the clinical and the laboratory records. The latter indicated disturbance of one or the other kind, while the conduct on the ward was reported to be fairly normal. It is suggestive that such a incongruity was only found in the introverted praecox personality type. The depressed patients were found to give a very typical performance, the main characteristic of which was a considerable steadiness. At certain instances, however, there was an increase of averages and standard deviation and this was always due to the fact that one or sometimes two reaction times of ten were very much longer than the rest. These patients consequently gave either a high and narrow frequency curve approaching the one of a normal, or gave the majority of the readings such a high curve while one or two times are at considerable distance from the rest on the abscissa. In opposition to this the frequency curve of a manic was always broad and low. Reading from patients in agitated states always gave frequency curves of the manic types, independent of the mood.

FURTHER OBSERVATIONS ON A RATING SCHEME FOR CONDUCT

Dr. James S. Plant said that one year ago his scheme was reported before the Society in its embryonic form. With a year's experience at this Hospital and certain briefer trials at other hospitals certain questions arising at the beginning could, at this time, be answered. Pearson's coefficients were calculated for all of the categories and the results reported. The brief experience with the system which Dr. Wright of the Vermont State Hospital has had was reported. Certain difficulties still existent were outlined together with suggestions as to the mode of escape from each. The author found the standard deviation of the mental categories a figure of great interest and probably some importance. Lantern slides depicting the finished curves were shown in the attempt to bring out the great practical value of the scheme.

CRITICAL REVIEW

Tumbelaka, R. ALZHEIMER'S DISEASE. [Psychiatrische en Neurologische Bladen, 1920, Nos. 1 and 2, January-April, pp. 1-101 (18 figs.).]

This important paper is divided into six chapters. In the first, Tumbelaka gives a historical review of Alzheimer's disease—which he calls the Redlich-Alzheimer disease, for reasons that will appear later—together with a clinical and pathological account of seventeen cases. In the second chapter he fully describes his own case. In the third he gives the anatomo-pathological changes which he found. The fourth chapter is a general one on plaques. The fifth gives his own observations and views on plaques, and the sixth discusses the classification and symptomatology of Alzheimer's disease.

Tumbelaka's case was a married man, aged sixty, a hodman who carried stones. In his fifty-eighth year, after the death of his torpid imbecile son, aged nineteen, he became increasingly depressed, and soon complained of eye symptoms. When he was a boy of twelve he was for four or five months irritable after quite a trivial fall on his head. He was not intellectual, had had but little schooling, could not write, could read a little, and never rose above hodman in his builder's work, though he did his simple work well. He was temperate, and there was no history of lues or infectious diseases. After the death of his son he became depressed, and at times he was irritable and forgetful; the depression increased steadily, and eighteen months after the onset of his disease his family noticed that near objects were often not noticed, whereas he saw more distant ones well. Often he collided with objects, and this led to severe affect-discharges. Soon he had to be led out of doors. His forgetfulness increased. Then he began to have anxiety attacks off and on, with visual hallucinations and delusions of persecution. These anxiety attacks, during which he fancied he was surrounded by murderers, often lasted for one or more hours and then disappeared comparatively quickly. Very soon after an attack he was quite well oriented. His memory of the visual hallucination was usually very vague, and he often compared it to a terrifying dream. As these attacks became increasingly frequent, he sought admission to the clinic. The remainder of his history showed that his childhood was spent in unfavorable conditions, and he had had then very little opportunity to develop his mental powers. During the time of his temporary irritability when twelve years old he complained now and then of giddiness, which, however, soon disappeared. At a later period he had slight headache, but never any nausea, giddiness, or heavi-

ness. and he never had any faintings, apoplectiform or epileptiform attacks. His family history was apparently good, and all his children—with the exception of his imbecile son—were healthy. When he was first examined by Tumbelaka he was in all ways well oriented, and made a good intelligent impression; he was contented, obliging, and unassuming, and showed interest in others. But his psychical state soon showed a rapidly appearing fatigability. After ten to fifteen minutes of psychical inquiry he showed distractibility, irritability, slight negativism, paraphasic utterances, perseveration, and difficulty in finding words. But when he was not psychically tired, he was tranquil and had good fixation of attention. Very patiently and with full concentration of attention he gave himself up to the repeated visual examinations, and coöperated well. Simple addition and subtraction sums soon proved too difficult. His fixation was diminished; he could not give a connected account of his past history, but he gave the chief points. The vegetative organs appeared to be normal. His arteries were somewhat thickened (age sixty). At first his muscle-tonus was lowered, but his power was good. His coördination was good, except for slight uncertainty in the heel-to-knee test. Convergence was impossible, but all other ocular movements were good. Gait unsteady when eyes are closed; cannot preserve his balance on one leg. Arm-jerks and knee-jerks normal. Right ankle-jerk slightly minus, left not obtained. Right plantar reflex definitely flexor; on the left side the big toe does not move at all, and the other toes tend to spread fanwise. Abdominal and cremasteric reflexes normal. Sensibility intact, as far as could be found out. Almost complete anosmia. Concentric limitation of both visual fields, not more than ten degrees of central vision being left. (A long, elaborate account of the ophthalmological examination is given.) The left optic disc is hazy. His visual projection in the sagittal plane was faulty, and he made no attempt to reach the object by the necessary arm- and trunk-movements owing to the interruption of the connection between visual projection and the corresponding associated arm- and hand-movements. His left pupil was the smaller; there was a diminished pupillary reaction to light from the blind part of both fields. Consensual reaction could not with certainty be established. There was no pupil-contraction on attempts at convergence. Painful stimuli gave no change in the size of his very small pupils. The menace-reflex was not marked; the winking reflex was present, but less marked from the blind part of the fields. Patient could recognize printed letters, but he was word-blind. Good visual perception of objects, and no apraxia. After two quiet days he suddenly had an anxiety attack, with hallucinations and delusions of persecution, of an hour's duration, after which he was well oriented and described his attack, as he usually did, as one of "nerves." For two months these attacks continued to occur, with varying severity. Between attacks he was often unconcerned, gay, and kind-hearted. When the attacks appeared, the memory attaching to them was associated with a strong negative effect. After the first few months his

psychical state grew steadily worse; the attacks had about the same frequency, but in the lucid interval his mood was often negativistic. Slight changes in local relations quickly led to partial disorientation and excited anxiety ideas. The failure to grasp a situation often gave rise to an anxious negativism, so that the examination of his mental, and even his somatic state evoked more and more resistance. His speech was now unintelligible, owing to perseverations and paraphasias; but these varied in their intensity so that he could sometimes be better understood. The left plantar reflex, which at first tended toward the extensor type (spreading of small toes), now became normal. For a long time the pupils showed no change, but gradually the light-reaction failed, first from the blind peripheral fields and then from the seeing central fields. In the terminal period of the disease his vision appeared to be quite lost. The steadily progressive dementia led to any important limitation of his mental life; delirious phases came more and more to the front. At nights he was continually busy in packing and unpacking his bedclothes, and he often micturated on the floor. Ultimately he became completely demented, his speech being almost unintelligible, he was almost or quite blind, became emaciated, and died from a pneumonia. Necropsy showed extensive bronchopneumonia with mucopurulent right pleurisy. Thyroid gland very small. Dura slightly thick; pia thick and turbid, especially in the parietal region. All cerebral convolutions small, especially in occipital lobe. Hydrops ex vacuo externa meningeae. Ventricles dilated. Microscopical examination showed in the cerebral cortex a great number of plaques of various shapes and sizes: the largest lie on, or close to blood vessels, and are of an infiltrative character. The underlying ganglion cells are well preserved. In the gyrus hippocampi the infiltrating plaques predominate, whereas in the other gyri the circumscribed plaques are in the majority; most of the latter have a diameter varying between 40 and 300 micra. The largest plaques are in the second and third cortical layers; in the deeper layers they become scarcer, and in the medullary substance adjoining the cortex they occur only sporadically. In the lamina zonalis they are scanty. (All this applies to silver preparations.) The Bielschowsky preparations show the Alzheimer's intracellular fibril-degeneration; this is especially abundant in the upper cell-layers of the parietal and occipital convolutions. Instead of the normal fibrillar cell-structure there is often merely a tangled ball of thick fibers remaining. Ganglion cells showing, instead of the normal fibril pattern, merely a black homogeneous ball, as described by Alzheimer and others, were not seen. The cell-preparations show an important deficiency of ganglion cells, especially in the three uppermost layers. Here and there are little places wholly devoid of cells. Part of the cell-less spots correspond with the round plaques which the silver preparations show plainly. The cell loss is greatest in the occipital lobe. The cortical architecture is disturbed owing to the influence of the plaques and the cell-displacements. Many ganglion cells are atrophied, others are swollen

and show chromatolysis; many contain much lipoid pigment; neurophages are increased in number. There is much glial fiber formation in the three upper cortical layers. Medullary sheath preparations show a great deficiency of fibers in the cerebral cortex; one can often see a degeneration of the medullary sheath proximally and distally of the plaque. In the cerebral white matter near the cortex a single plaque is sometimes seen, but there is in it an increase of glial elements, both diffuse and in little heaps. The thalamus shows sporadic round plaques, and both striatum nuclei have a few plaques here and there. There are none in the hypothalamus, cerebellum, pons, or spinal cord. In the corpus geniculatum externum there are no plaques, but there is a diminution in the number of its large, medium, and small cells; the remaining cells are altered, and show (especially the large ones) lipoid pigment. Wernicke's field is poor in fibers. The pulvinar is deficient in cells. In the anterior quadrigeminal body there is a diffuse deficiency of medullary fibers, especially in the deeper layers, and also a diffuse cell-deficiency. The strata sagittalia, both interna and externa, are very small; a particular localization of fiber loss in their dorsal or ventral parts was not observed. In the various cranial nerve nuclei nothing was seen except a lipoid degeneration in some cells. Tumbelaka points out that these pathological changes agree with the symptoms present during the last months of the patient's life. Thus, the occipital lobes show the greatest reduction in size, and also the most intense histological changes. The concentric limitation of the visual fields probably occurred gradually. It was due to the rather rare condition of intense diffuse changes in the occipital lobes, whereas it is usually due to some bilateral occipital foci. The case does not throw any light on the question of the projection of the macular bundle on the cortex, nor on its position in the optic radiation, for the patient was as good as blind during his last month. Tumbelaka asks: "Is this disturbance in his projection in the third dimension of space capable of interpretation physically, or do we see in it a change in the distance-innervation (*entfernungs-innervation*) of Donders?" He replies that we might find a not inconsiderable place here for a physical factor. But he seems to incline to the view that the coincidence of the particular psychical relations and the anatomical changes demonstrated pathologically, helps us to understand the gross errors in the patient's visual perception of depth (*diepte-zien*). In short, the failure to grip an object in the sagittal plane was due to an interruption between the visual projection and the requisite associated gripping-movements, dependent on abolition of the anatomical connection between the visual area and the motor area of the cerebral cortex. As the changes in the involved nuclei do not explain this condition—and the loss of convergence—Tumbelaka attributes them to the diffuse cortical lesions found. As to the alexia, we have to remember that the patient had had very little schooling, and that his reading was limited to the Bible and the newspapers, so that trifling parietal lobe lesions could easily upset

his reading powers. The speech disturbance, which was chiefly of amnesia and paraphasic character, is sufficiently explained by the pathological changes found. During the course of the disease, especially in its terminal stage, the general increase of muscle-tonus showed the great extent of the morbid process. All parts of the cerebral cortex were involved, with merely local variations in intensity, so that the increase of muscle-tonus is really a kind of decerebrate rigidity ("out-herseningsstijfheid").

We come now to chapter 4, a general one on plaques. In the year 1906 Alzheimer regarded them as miliary foci which depend on the deposit of a peculiar substance in the cerebral cortex; at a later date he called them "Fischer's plaques." Fischer called them "miliäre drusige nekrose" or "Drusen." Bielschowsky described them as "Alzheimer's submiliary foci." Frey attributed the origin of the term "plaques" to Perusini. Fischer regarded the "drusen" as pathological abnormalities, formed by a conglomeration of the most delicate filaments; these grow as a foreign body in the nervous system and displace the tissues; the plaques damage, but only exceptionally destroy, the tissue, and then only when they infiltrate it diffusely or enclose it; only in a small percentage of cases, and in advanced age, is any proliferation of axis-cylinders and fibrils produced, and there is no inflammatory reaction. Fischer describes the following stages of plaque formation: (1) The little constellation stage, *i.e.*, the initial stage in which fine black star-shaped little fibers invade the cerebral substance and displace the fibrils and surrounding tissues to one side; a conglomeration of many small stellar masses then takes place. (2) The stage of day-star formation. By the further outgrowth of single fiber bundles from the little stellar mass the plaque takes an irregular form, as of the day-star. (3) The stage of spoke formation, wherein the apices of single fiber bundles grow still further from the day-star and penetrate the neighboring tissues; at the same time there is also the beginning of development of a fiber-ring ("rand-ring") round the plaque. (4) The stage of little-wheel formation. The fiber-ring has completely formed, and gives the impression of a condensation of the fibrils of the surrounding tissue. In this stage the changing plaque may by Bielschowsky's method be stained achromatically or black; in the latter case the whole fiber-ring is black and the central part of the plaque is brown. (5) Stage of thick-fibered skeins. This is recognized by the appearance of a ball of thick metachromatically stained fibers. Fischer describes also three further stages, *viz.*: (6) "Piltzartige destruktion der Gefässwand." (7) "Destruktions-stadium der drusen," and (8) "Diffuse infiltration des Nervösen gewebes durch die fädigen massen." Fischer never found all these stages in any given case, nor did the youngest and the oldest stage ever go together. The essence of his conception of plaques is that they are formed out of small fibers which at first are inclosed between the neurofibrils as a stellate cluster; that

through further growth various morphological forms appear, and finally in their oldest stage present themselves as a thick-fibered ball that can go to destruction. In connection with the fine-fibered structure of the "drusen," Fischer calls this process "sphaerotrichia multiplex cerebri" or "drusen-krankheit," an anatomopathological condition which, according to him, is to be identified with no other. He describes axis-cylinders in, around, or near the plaques, which he regards as destroyed by this process and proliferating at their terminations to form thickenings of various shapes.

Alzheimer gives quite a different conception of the plaques: He begins by distinguishing two parts, (1) a central, (2) a peripheral. The central part or "nucleus" contains an amorphous, unorganized mass, a still unknown substance, which is deposited in the cerebral cortex and bears various outward distinctive marks by means of various chemical staining reagents. In contrast with Fischer, he attaches not the slightest importance to the age-determination of the form of the appearances in the nuclei. In Bielschowsky preparations the nucleus of the plaque has at one time a uniformly homogeneous structure, and at another a radial striping towards the margin. In the scharlach-red preparations he saw, in this central part of the plaque, granules giving a lipoid reaction. With silver impregnation they show as black granules. With Weigert's glia-stain he found a central spot in the plaque-nucleus which stained brown with iodoform; also with other stains he often saw a homogeneous structure of the nucleus. Alzheimer saw Fischer's "Fädenpilz" but seldom, and regarded it as an artefact. He combats Fischer's conception according to which plaques grow out of a group of small fibers to form variously-shaped bodies. For him, the smallest plaques with a homogeneous plaque-nucleus represent the youngest phase. That this nucleus is the product of a deposit, he thought he might conclude from the fact that he found therein no rests of ganglion cells or glia cells, and through the increased deposit of this pathological material the surrounding tissue is displaced. At the same time a series of changes, regarded by him as reactive, takes place in the periphery of the plaque; he found there regularly a greater or smaller number of glial formations, such as glia granule cells, fan-shaped structures, Weigert's glia fibers, and protoplasmatic glia cells with peculiar changes therein. Numerous glia fibers run in this part of the plaque; the glia fiber-formation was seen by Alzheimer only in the uppermost cortical layers. In this part also are many decay-products of nerve elements which were broken off by the glial elements. Alzheimer, like Fischer, found in the plaque-periphery fan-shaped terminations of axis-cylinders, which he regarded, however, as due, not to a proliferative process, but to disintegration of the fibrils, such as occurs in the neighborhood of tumors. More recent investigators have agreed much more with Alzheimer than with Fischer who has had no adherents.

Simchomicz saw in various preparations the nucleus of the plaque as a needle-shaped, radially-placed mass of a crystalline substance; in its periphery he saw many altered ganglion cells.

Perusini described the plaque-nucleus as a formation that often shows a radial striation. He failed to find axis-cylinders in the plaque-periphery. He regarded the process as one by which pathological substances are deposited in the glia-reticulum.

Bonfiglio regarded the plaques as degenerated ganglion cells.

Barrett says that in an early stage the plaques give him the impression of a local necrosis of the tissue. Some fragments of the necrosed substance can still be found in these little areas while the largest part thereof has already passed into a homogeneous mass which forms the middle of the plaques. The whole plaque then becomes surrounded by the progressive reactive proliferation of the glia. He refrains from an opinion as to the primary cause of the plaques.

Hübner regarded the plaques as deposited disintegration material.

Sarteschi saw altered spider-cells in the plaques.

Frey distinguishes in Bielschowsky preparations (1) a central nucleus, (2) around it a peripheral circle ("hof"), and (3) immediately bordering this a peripheral marginal ring. The nucleus is homogeneous in its center, but peripheral-wards it has a fibrous exterior. He thinks that the intermediate region of the plaque between nucleus and marginal ring is the place wherein amorphous masses of cell-rests lie that by Bielschowsky's method are sometimes slightly, and at others darkly impregnated. Occasionally Frey found ganglion cells in the peripheral part of the plaque, and also, unlike Perusini, thick neurofibrils coursing through. In the marginal ring he found fine fibrils, of uniform size, which he regarded as glia fibers, and coarser ones, interpreted as neurofibrils. He also saw rod-cells, filled with disintegration products. Around the plaques the glial elements formed fibers which were wholly encapsulated. The glial cells play only a secondary part in the formation of plaques, and are reactive, whereas the rod-cells play an important part. Frey found that the ganglion cells round the plaques were often displaced; the plaques appear to press on the specific nerve elements of the cortex.

Tumbelaka here points out that in 1898 (eight years before Alzheimer's first paper) Redlich observed these pathological changes and the lesions in the cortex. His paper was entitled "On miliary sclerosis of the cerebral cortex in senile atrophy." His case was a woman of seventy-one who had great defect of memory, followed by severe dementia with amnesic aphasia, asymboly, and apraxia. After four years she had epileptiform attacks with loss of consciousness and clonic convulsions, without subsequent paralyses. She then became bedridden, and died from bronchitis six years after the onset. Necropsy showed atrophy of the whole cerebrum; especially the frontal and temporal lobes were small. By carmine and Weigert glia preparations foci of thickening were found there, which Redlich called miliary sclerosis or plaques. He saw that

their formation ran parallel with the degree of what he called "the atrophic degeneration of the ganglion cells," and he thought it probable that there might be a genetic connection between these two. He therefore asked himself whether the disease was primarily in the ganglion cell and the glial proliferation secondary, or the latter primary and the strangling of the ganglion cells its secondary result. He reasoned thus: in the first case the miliary sclerosis should be the indicator of the disappearance of the ganglion cells, whereas in the second the glia cells should play the leading part. The fact, now, that there are places in which definite glial changes are lacking, while the ganglion cells already show the characteristic signs of the senile atrophy, justifies the supposition that primarily the nerve elements are destroyed, and with their destruction the glia goes on to proliferation and taking up of pigment. The thus hypertrophied glia, rich in fibers, undergoes now regressive changes, on account of the nutritional changes on which also the general senile atrophy depends, which lead to the plaque-formation. Redlich saw the plaques only sparingly in the molecular layer; great numbers in the small pyramidal layer; hardly any between the large pyramidal layer. In the deeper layers of the cortex they became fewer, and he saw none in the medullary substance, nor in basal nuclei, cerebellum, pons, and spinal cord. He found greatly shriveled dendrites, and intensive staining and brightly shining ganglion cells with increase of pigment. The medullary fibers of the cortex were reduced, not only the radial ones, but also the tangential and the supra-radial. No marked vascular changes were found, and no cell-infiltrates. The white matter was much diminished, yet its glia was increased; there were spider-cells which often showed a pigmented cell-body. Foci of softening were nowhere found. The left hemisphere was more affected than the right; the central gyri and the parietal and occipital convolutions had suffered less than the remaining parts of the cerebrum. The brain-stem ganglia and the bulb showed pigmented cells. In the granular layer of the cerebellum there were, in various places, fiber-rich glia cells with a large cell-body, but no plaques. Tumbelaka here remarks that all the points which occur in the papers of Alzheimer and later workers—from 1906 onward—had already been accurately considered many years previously by Redlich. A second case of Redlich's is detailed, which closely resembled his first one, with numerous miliary scleroses on necropsy, and a general histopathological picture very like that of his first case. He pointed out that in both of his cases a diffuse cortical process produced speech disturbances (aphasias, etc.) of such an intensity as are usually found only in cases of gross anatomical lesions of the speech centers. The really new point that Alzheimer has firmly established by his study of this disease is the intracellular fibril changes, to which his name has rightly been attached. "If," says Tumbelaka, "we wish to give a name to the whole clinico-histological picture of this disease, we ought to call it the 'Redlich-Alzheimer disease.'" Pick has described two cases of local brain atrophy, with their symptomatology;

although a microscopical examination was omitted, the similarity of his cases to those of Alzheimer, Redlich, and others is so great that it is probable they belong to this group of diseases. Redlich even points out that before his time the existence of plaques was known to Obersteiner, Blocq, and Marinesco. Also Myake described senile plaques and spoke of them as glia-rosettes, while, later, Wada described plaque-formation as due to circumscribed necroses of the nervous parenchyma and of the glia.

At the end of this general chapter on plaques Tumbelaka writes thus: "Now, if the observations and views of the investigators named by me were correct, we might expect that in a condition, wherein the cerebral cortex and the neighboring parts are full of displacing plaques, we should have an increase of the total brain weight and an increased volume of the gyri, so that thus narrow sulci and fissures and broad convolutions would exist. While this loss and the atrophy of the ganglion cells might somewhat compensate for the increased weight and volume, yet we might still meet with normal morphological relations. The reality, however, shows quite another outward picture. All observers tell us of very great atrophies and an important lessening of brain weight. Alzheimer himself said that the atrophy of the convolutions is proportional to the density of the plaques. He does not seem to have seen the discrepancy between this observation and his conception of the genesis of the plaques. Also, other observers have found that, where the gyri are the smallest and the sulci and fissures the widest, there the plaques are most abundant. There must, then, be an error hidden in the histological observations and views of Alzheimer, Fischer, Frey, and others, concerning the existence and development of the plaques and the relation between them and the remaining changes in the cortex."

In chapter five Tumbelaka describes his observations on plaques, and discusses their mode of formation. A plaque, as seen in cell-preparations by various staining methods, appears as a cell-free spot; in its center is the plaque-nucleus which is distinguished from the surrounding plaque-hof (halo, circle, or periphery) by its darker color. The darkest point of the whole plaque is the center of the plaque-nucleus. There is often a radial pattern at the point where the nucleus merges into the "hof"; the coloration of the hof merges gradually into that of the surrounding tissue. In many of these cell-free areas we see that the immediately surrounding tissue is rich in cells. This cell-rich zone, in which the cells often lie closely packed together, borders toward the periphery on a zone, poor in cells, which will here be called "zone x ." This zone x merges imperceptibly into the surrounding tissue. Further research has shown that the cell-rich zone owes its existence to a migration from far-off glial elements in the direction of the center of the plaque. Zone x arises from this displacement of cells. The greater the cell-density in the cell-rich zone, the more distinctly does the cell-poor zone x strike one, and vice versa. Often the migration is irregular; thus, in some places the

cell-dense zone is not plainly differentiated from zone x , while in others it is plainly marked off from it. As a result of the advance of the migration toward the center of the plaque, the plaque-hof becomes smaller, and zone x broader. As the glia cells finally come to lie against the nucleus, we have thus from center to periphery this succession: plaque-nucleus, cell-dense zone, and zone x . Not seldom it happens that some glia nuclei are far in advance of others; these specially active elements can be already very dense in the plaque-nucleus at a stage wherein there is scarcely any question of a beginning mobilization by the great majority of the glia elements of the surrounding tissues. The nuclei of many of the migrating glia elements undergo morphological changes during their progress; thus they become somewhat longer, and take the shape of rod-cells with the protoplasmic processes directed toward the center of the plaque. In sections these oblong glia-nuclei are at one time cut through longitudinally and at another transversely, so that the glia nucleus may appear either oblong or punctiform. Whenever two or more plaques lie close together, their common influence on the surrounding tissues makes it difficult to recognize a definite cell-rich zone and a zone x , and the migration is very irregular. Here and there, owing to the migration of the glia cells, the ganglion cells become drawn together, so that they can undergo much displacement and arrive in the midst of a heap of migrated glia cells. The possibility of this passive displacement of ganglion cells is intelligible when we bear in mind the relation to the glia cells. Cajal and Mallory-Alzheimer preparations show us how intimately the glia cells embrace the ganglion cells by their processes. That in these circumstances, by the displacement of a glia cell, a ganglion cell can easily be carried away, or at the least can be drawn out of its normal position, is no wonder. Some ganglion cells are tilted, as well as displaced. Up to the present time the cell-poor "zone x " has escaped the attention of all observers. By some of them the cell-dense zone has been regarded as the result of the pressure on the tissue by the plaque. Also, from the presence of fibrils running with a curve round the plaque, Alzheimer, Fischer, and others have inferred an expanding growth. Tumbelaka here remarks that his theories concerning the plaques are quite different from those of other observers. He then refers his readers to his eighteen figures *seriatim* in support of his views on this subject: the series of figures from 4 to 8 is particularly instructive. For Alzheimer believed that plaques continually increase in circumference, and that small ones are younger than the large ones. This conception conflicts with the appearances seen in these five figures of Tumbelaka. From the fact that the zone x of the small plaque in his figure 8 is clearly poor in cells and relatively broad, we must conclude that we have to do here with a plaque which has diminished in size. Breadth of zone x is a proof of the previous existence of a large plaque-hof. His figure 10 shows a passive migration of ganglion cells accompanying the active migration of glia elements. These ganglion cells lie in contact with the glia elements well

inside a well-marked zone *x*; some of them have an atrophic appearance, while one is swollen, and the most external one shows a more acute chromatolysis. In figure 11 we again see ganglion cells carried in with migrating glia cells; in addition to the broad zone *x*, we see here also various elongated glia cells (rod-cells). Figure 12 shows a plaque which appears in this section as a heaping up of glia elements; no nucleus is present. This plaque is regarded as cut tangentially. It might be said that this is the end-phase of a plaque that is completely substituted by glia cells. If that were the case, this picture would represent a further phase than that shown in figure 8. In figure 8 we have an almost cell-free zone *x*, but in figure 12 many cells still occur in the surrounding tissue. From figure 8 we learned that the smaller the circumference of the plaque nucleus and the plaque-hof, the smaller is the number of glia cells. There seems to be no risk in supposing that finally the plaque-nucleus disappears simultaneously with the last glia-nuclei which were taken up by the clearing away of the pathological products, leaving a cicatrix of glia fibers which become smaller by retraction and finally can be found only with difficulty, or not at all. The presence of so many cells in this figure 12 shows that it is not the expression of an end-phase. Figure 13 of a preparation made by Fieandt's method shows the plaque-nucleus as a light-colored spot, of homogeneous structure, plainly marked off from the surrounding plaque-hof. In this plaque we have an irregular migration; the picture resembles that of figure 9 very closely. Figure 14 is from a Weigert glia-fiber preparation; the plaque-nucleus is colored yellow, with a brown spot in its center, representing the central spot; round the plaque-nucleus lies a ring of glia nuclei from which numerous fibers run far out in all directions. Figure 15 shows two plaques, close to each other, by Cajal's glia-stain; numerous processes of glia cells penetrate the plaque and partly surround it; the glia cells which have this relation to the plaque show a very thick protoplasmic process which is in close relation to a blood vessel. Figure 16, of a plaque from the lamina zonalis, shows numerous rod-cells. Figure 17 represents a preparation that was kept in pyridine for six hours before Bielschowsky's impregnation was applied. Through the pyridine the plaque has lost much of its argentophile substance, so that it is possible to distinguish the details of the plaque. The plaque in this figure resembles those shown in figures 6 and 7, and shows how the plaque-ring, which, when densely impregnated as in figure 3, gives no details, is actually composed of a number of strongly impregnated glia-cells. Figure 18 shows a number of ganglion cells, mostly from the fifth cortical layer, with Alzheimer's fibril-degeneration. Tumbelaka is convinced that the numerous fibers, which course in the plaque-ring or go through the plaque-hof, are, if not all, then at any rate preponderatingly of glial nature. He mentions that Oppenheim held that the fibers which terminate in the plaque are glial. The disputed point whether cells occur in the plaque-hof or not is answered by Tumbelaka's figures 9 and 13. The opinion expressed by

other observers that the cell-elements of the "hof" are really rests of glial or of ganglionic cells is clearly erroneous; they are just glial elements that have advanced far in front of others in this very active glial migration. If the study of the cell and glial preparations had not been neglected and the Bielschowsky method exalted to the position of a specific method for plaques, no discussion of this question would have been needed. In silver preparations these glial elements lie hidden under a great abundance of black, large or small, granules or rods. Tumbelaka here points out that in the application of the silver-impregnation method according to Levaditi's directions we observe that, before any other part of the cerebral substance has taken up the silver, the plaques are already recognizable as dark polymorphous spots; they may be defined as spots or areas which have a specially great affinity for silver. Plaques are of two forms, (1) circumscribed, (2) diffuse. The former are often round; the largest of them vary between 40 and 300 micra. The diffuse plaques are much larger, and are often found lying on vessels. The comparison of immediately succeeding sections, which are impregnated by Bielschowsky's method at various moments, teaches us this: there are preparations in which heavily impregnated circumscribed plaques occur together with diffuse infiltrative forms. In others we find only less strongly impregnated circumscribed plaques in which various plaque-details can be distinguished; in these preparations diffuse forms are absent or ill-defined. Heavily impregnated round plaques are often merely a heap of dark brown or black granules and of rods of different shapes, size, and length, in which it is impossible to distinguish the parts of the plaque. The same sort of dark brown granules and rods, though of smaller calibre, we see situated between ganglion cells and extracellular fibrils in diffuse plaques. The fact that where the circumscribed plaques are less strongly impregnated, there the diffuse ones are either not seen at all, or but vaguely, proves that the latter have lost their silver-retaining power before the former. This is specially shown by the influence of pyridine on the plaques; if the section be put into pyridine for four hours before applying Bielschowsky's method, the affinity for silver is notably diminished. By this treatment, preparations show no more diffuse plaques; the round plaques are then weakly impregnated and allow us to see the details of their structure plainly. A comparison of figure 17 with figure 3 makes this plain: the former is of a section treated by six hours' previous pyridine saturation; figure 3 had no such preliminary treatment. In figure 17 we see cells lying close together to form the glial plaque-ring, while in figure 3 all details are irretrievably covered by dark brown granules and rods. After from two to twenty-four hours of the action of pyridine the argentophile substance disappears entirely from the circumscribed plaque; in these preparations slight little spots of a very loose and irregular structure occupy the place where the plaque was situated. On the ground of this experience, Tumbelaka concludes that the circumscribed plaques must contain a larger quantity

of argentophile material than the diffuse. The comparison between the silver and the cell- and glia-preparations shows at once that in the last not all spots are perceptible which show a high affinity by the impregnation method. In the cell-preparations the diffuse plaques are not to be found; only the circumscribed forms which have reached a certain degree of development are found. In the glia-preparations diffuse plaques are not with certainty visible; we find here and there a glia-cell of great size, without any direct relation with a circumscribed plaque; also scattered little areas with a somewhat thickened reticulum. Spots corresponding to the diffuse plaque in silver preparations can at most be merely conjectured. Here Tumbelaka offers the following as being most in agreement with his just described morphogenesis of the circumscribed plaques and with the other peculiarities which the cell-, glia-, and fibril-preparations have furnished: Owing to some still unknown cause we have, especially in the cerebral cortex, circumscribed little spots in which ganglion cells, glia elements, vessels, and conduction-paths running through that area, are destroyed; at the same time an argentophile substance is formed. To this process the organism reacts by a mobilization of the glial elements from the surrounding tissue. The glia cells penetrate this pathological substance, apply themselves against it, or send processes in. To this contact with the argentophile substance of the little area the glia cells owe their impregnability with silver. As a result of the migration of the glia cells, the affected area becomes isolated from its surroundings, and at the same time the pathological product is eliminated from the cerebrum. Finally, a glial cicatrix is left remaining over the affected spot that is of much smaller size than the original pathologically affected area. That a pathological argentophile substance can be formed by the decay of cerebral tissue will be evident from the intracellular changes known as the Alzheimer fibril-degeneration. As a rule, plaque-formation and Alzheimer's fibril-degeneration occur together. But that there is no necessary parallelism between them is evident from cases described by Alzheimer, Lafora, Schnitzler, and Frets. The two first-named writers found plaques in which no fibril-degeneration could be seen, while the two latter found fibril-degeneration without any plaques. These cases by no means diminish the value of our position, says Tumbelaka, that in pathological circumstances the brain substance can be destroyed, with the formation of a product that has a greater affinity for silver than the normal nerve elements. That the existence of this argentophile substance is not solely concerned with the ganglion cells is evident from the occurrence of circumscribed plaques in the lamina zonalis and the central white matter of the cerebrum.

As to the diffuse plaques: it can be conceived that they represent a preliminary stage of the circumscribed, that the argentophile substance would be formed before the cortical elements are destroyed, and thus come to lie between the still preserved cells. For a number of diffuse plaques this may perhaps be possible. But for the majority of these large

plaques this kind of origin cannot be right. As we have seen from a study of successive sections, there are some of the diffuse plaques which extend from the brain surface to the third and fourth cortical layers, as shown in Tumbelaka's figure 1. Now, if this diffuse plaque of that figure were a preliminary stage of the circumscribed forms, then one would expect that among these last, which are present in great numbers in Tumbelaka's case, we should see at least one extending from the cortical surface to its deeper layers. But never in the literature nor in his preparations did he find similar circumscribed plaques, for which reason he says we must place the diffuse plaques, at any rate for a large part, outside the above-mentioned morphogenetic line. The relation of these diffuse plaques to the course of a vessel, and the richness in argentophile material of the circumscribed plaques in comparison with the diffuse leads Tumbelaka to the following conclusion: By the destruction of small spots in the cortex the argentophile substance is formed; the elimination of this pathological product takes place chiefly thus: the spot in which the destructive process takes place is isolated from the surrounding tissues by the migrated glia cells. Later, when the argentophile material is entirely assimilated and removed by the influence of these cells, they (the glia cells) enter into its place. Tumbelaka suggests that before the plaque is isolated, and especially in the early stage of the destruction of the brain tissue, part of the formed argentophile products may be removed from the cerebrum by the lymph-paths. Experiments by Mme. Winkler have suggested the probability that suspended substances introduced into the brain-substance can be found round blood vessels, along which the foreign material can pass out of the cerebrum. Tumbelaka thinks that the relation between diffuse plaques and the blood vessels may safely be taken as the expression of a transport of the argentophile material by way of the lymph- and blood-vascular systems out of the cerebrum. This conception is, he thinks, wholly in agreement with the fact that in his figure 1—of a Levaditi's silver-impregnation preparation—the blood vessel is surrounded by the pathological argentophile material the whole distance from the third and fourth cortical layers to its escape on the surface of the brain. The study of Weigert-Pal preparations showed an important diminution of the parallel-running fibers on the cortical surface. Very often Tumbelaka has seen from the circumscribed plaques the Wallerian degeneration, and now and then also an axi-petal medullary sheath degeneration. There are, however, numerous plaques from out of which the degeneration cannot be followed in these preparations. The medullary sheath destruction is plainly not so far advanced here that it can be made visible by the Weigert-Pal method.

Tumbelaka ends this chapter by remarking that it is established by cell and glia preparations, as well as by Bielschowsky and Weigert-Pal ones, that circumscribed plaques are little spots in which the brain substance is wholly destroyed. As all these spots are replaced by glial cicatrices, this process of necessity leads to an important diminution of

the convolutions with consecutive widening of sulci and fissures and lessening of the brain weight. We see, then, here that there is a complete agreement between the morphological relations, the histological observations, and the conceptions which are deduced from them; and this cannot be said of the theories of Alzheimer, Fischer, and others concerning the morphogenesis and nature of the plaques.

In his last chapter Tumbelaka discusses the symptomatology and classification of the Redlich-Alzheimer disease. The onset is very often very gradual, generally with psychical symptoms. In the cases of Alzheimer (case 2), Bielschowsky, Fischer (case 2), and Tumbelaka the disease was connected with the reactive depression following the death of a relative. These patients were quieter, and more dull and forgetful than the others. In the cases of Perusini (1 and 2), Fuller, Sala, Fischer (4), and Frey (1 and 2), the disease began with a tranquil forgetfulness. Barrett's case began with a sort of motor impulse and an inclination to aimless wandering about, with at times periods of howling, crying, and laughing. Janssen's case differed from all these by the fact that the disease set in very acutely with a delirious phase of some days' duration. During the greater part of the course of the disease in all these cases there was an alternation of phases of depression, euphoria, and increased irritability. The case of Sala is noteworthy, for his patient was able to work on the land for three years after the first signs of defect of memory appeared; he then became suddenly greatly excited, and a condition of despair was established, with crying, gesticulation, and running hither and thither; after this attack of excitement his disease progressed steadily. As a general rule, there were delirious phases during the last months of life in Alzheimer's disease. From the beginning there was a continually increasing intellectual diminution, till finally the dementia was so profound that psychical contact of the patients with their environment was reduced to the minimum. Transient absurd delusions, often of persecution, coupled with hallucinations both visual and auditory, repeatedly occurred. Next to the markedly progressive dementia, which may be regarded as the chief symptom of the disease, various neurological symptoms occur: the clinical picture can here vary considerably; the differences in the extent, the localization, and the intensity of the morbid process in the cerebral cortex make these symptomatological variations intelligible. Outside the cortex the changes are often so slight that we can leave them out of account in the symptomatology. General cerebral symptoms, such as headache, nausea, vomiting, and pulse changes seldom occur. In only two of the cases were slight nausea and vertigo present, and then only early in the disease. As typical examples of cases in which the morbid process played itself out in particular cortical areas we may take the second case of Redlich, Barrett's, and Tumbelaka's. In Redlich's patient the aphasia symptoms were so predominant and were so far in advance of the other signs that a local lesion in the speech area had to be considered. In Barrett's case the motor signs were so prominent

that the clinical picture had much resemblance to a system disease, viz., to an amyotrophic lateral sclerosis. Tumbelaka's case is an example of a particular localization, viz., in the visuo-sensory areas, resulting in a double bilateral hemianopia such as occurs in interruption of both optic radiations. In two of Perusini's cases the severest morbid processes were localized in the parietal lobes. While Alzheimer's first case showed uniform diminution of the cerebral convolutions, the greatest destruction in his second was in the parietal and temporal regions, and the occipital lobe was the least affected. Frey found most change in the parietal lobes, and Janssen thought the temporal lobes showed the most marked lesions. Bielschowsky found the greatest change in the frontal lobes and especially their orbital surface; there was no appreciable difference between the intensity of the changes in the motor and the sensory areas. By Lafora the greatest change was found in the right cornu Ammonis. Fuller speaks of a regional cerebral atrophy, specially of the right and left frontal and the left temporal lobe. Sala describes the gyri hippocampi as the seat of the most numerous and the biggest plaques. If we bear all these instances in mind, we may expect to find in future cases that the clinical picture may present other more or less predominant cortical symptoms, according to the seat of the lesions. But, seeing that the destructive process is often diffusely spread over the whole cortex with here and there farther advanced stages, sharply circumscribed nervous symptoms may well be expected to occur but sparingly. In the motor sphere numerous disturbances occur. Many of the patients had a more or less bent forward attitude of the trunk and a "trit-trot" gait, as is mentioned in Kraepelin, Bielschowsky, Simchowicz, Janssen, Frey, and others. The muscle-tonus is usually increased, especially in the terminal stage. Strong contractures of the lower limbs are seen, specially in the adductors. Fuller saw the greatest spasm, toward the end of the disease, in the shoulder muscles. In Tumbelaka's case the muscle-tonus was lowered at his first examination, but soon a definite increase was present. Simchowicz describes a mask-like facies, nystagmus, tremor of lips, and a dyspraxic tongue. Alzheimer saw in an advanced stage of his second case a transient facial paresis, and Janssen saw a unilateral facial paresis of very short duration after one of the epileptiform attacks of his patient; and the same patient had a temporal hemiplegia when her disease had lasted eighteen months. Tremors, of greatly varying intensity, often occur in the extremities and also in other parts. Epileptic attacks have been noted by several observers; in Alzheimer's second case one occurred some months before death, the total duration of the disease being five years. In one of Perusini's cases, lasting for eight years, an attack occurred three months before death. Barrett's patient had an attack half way through his three years' illness. In Fischer's second case, lasting for eight years, the first attack occurred six, and the second one year before death; his third patient had one two and one half months before death, and one on the day of death: his last had one attack in a three years'

illness. In Janssen's case as many as four attacks occurred in her three years' illness. Generally, it may be said that epileptic attacks are exceptional, and when they do occur they usually do so but once, and then commonly at an advanced stage of the disease. The reflexes are in some patients now raised and then normal; occasionally one or other reflex may be diminished. In Tumbelaka's case the right ankle-jerk was diminished, and the left not obtained. Babinski's sign is mentioned only by Barrett; in Tumbelaka's case it was for a time doubtful on one side. On this side the big toe remained motionless and the other toes showed a tendency to fan-like spreading, whereas on the other side there was a definite flexor response. Disturbances in coördination were observed by Perusini, Barrett, and Bielschowsky. The speech is often slower, and not seldom the articulation is less clear than normal. Pupil changes have occurred in numerous cases: in Perusini's first case the small pupils reacted sluggishly to convergence and light; sluggishly reacting pupils were seen also in his third case, in Frey's first and second, in Kraepelin's, and in Sala's. The literature makes little mention of the special senses: one of Perusini's cases complained early in the course of the disease that an existing visual defect, dependent on an old corneal opacity, had become worse. In one of Fischer's cases there was for a time hardly any pupil-reaction to a powerful Nernst lamp. Hitherto there has been no mention of a gradual and total defect of the visual fields, such as occurred in Tumbelaka's case. By most observers aphasic disturbances are mentioned, and by some also defects of higher nervous expressions. The analysis of these disturbances in speech, gnosis, and praxis is often very difficult, owing to the continually existing more or less marked dementia. Thus, Bielschowsky's patient came with an already far advanced dementia in which there was an exceptional diminution of the memory and fixation, with a greatly diminished vocabulary; to many questions a mere "yes" or "no" was replied; repetition was good, apart from the perseverations which it excited. Objects cannot be recognized, and complicated commands gave a negative result. In an attempt to light a match the patient makes unsuitable movements, and his incapacity to do it gives him pain. The same thing occurs in the examination for the various forms of aphasia. In contrast with this condition there were in Redlich's second case disturbances in the higher nervous functions which were far in advance of the dementia and other signs. Numerous transitional cases occur between these two forms. Thus, some observers speak merely of "peculiar" disturbances of speech. Kraepelin speaks of "indications" of asymboly, apraxia, agnosia, transcortical or sensory aphasia. Janssen mentions apraxia, aphasia, asymboly, and perseveration; Sala, paraphasia, perseveration, word-deafness, asymboly; Fuller, sensory aphasia and a transient ideational apraxia during an attack of influenza; Frey (case 1), perseveration, expressions of mind-blindness, and apraxia, and Frey (case 2), apraxia and perseveration. In far advanced cases many writers mention also logoclonia, such as occurs in paralytic dementia. In Tumbelaka's

laka's patient, when the degree of dementia had not yet made the examination difficult, perseverations and amnesic-aphasic signs appeared as soon as a mere psychological fatigue was produced; at a later stage these signs were present apart from fatigue, and there was also alexia. It has been the general experience that disturbances of the higher nervous functions have often changed greatly in intensity, so that there may be on one occasion pronounced aphasic symptoms and at the next examination none. Among the various peculiarities of speech, gnosis, and praxis which have been hitherto noticed, Fischer suggests another meaning. Analysis of his four cases led him to conclude that the reactions which very often resemble aphasic, agnosic, or apraxic utterances are expressions of disturbances of attention which appear either intermittently or remittently. The pathological changes which occurred in the whole of the cortex in these patients he found did not show such a degree of intensity in the superior temporal convolution that he could see in them any ground for disturbances of the higher nervous functions. From this experience he considered that in analogous cases symptoms described by various observers as aphasia, agnosia, or apraxia must really have been symptoms of defect of attention. The leading idea of this negation of clinical observations of others is that Fischer regarded the occurrence of destructive nervous symptoms, such as aphasia, agnosia, and apraxia as conflicting with his theory of the "sphærotrichia multiplex cerebri" (his "Drusen-Krankheit"), *i.e.*, the theory that the growing plaques merely press aside the nerve elements without destroying them, so that symptoms of organic nature do not belong to Alzheimer's disease. But we have shown above, says Tumbelaka, that this pathologico-anatomical conception rests on an erroneous observation, and that in reality the formation of plaques is related to a locally occurring decay of nerve elements, so that in the presence of a large number of plaques there could not fail to be symptoms of cortical destruction. We see in our case, as in others, that the severe dementia which has generally been present is due to a considerable extent to the destruction of a great number of nerve elements. All observers mention an extension of the process over the whole cortex. This extension renders it intelligible that there must be disturbances of speech, gnosis, and praxis, because the whole cortex is concerned in their production. Tumbelaka thinks that the intermissions and remissions of these higher functional disturbances may be a sequel of the manner of progression of the cerebral process. The period in which the clinical symptoms are specially pronounced corresponds with a fresh progression of the process or with temporary nutritional disturbances in the affected cortex which are related to this process. The moments of undisturbed, or but slightly altered speech, etc., are, then, the expression of the temporary recovery of the cortical functions from their previous disturbed state. The presence of plaques in varying stages of development is sufficient reason for an irregular progression of the morbid process. That plaque-formation can abolish other than the highest cerebral functions

is plainly shown by the cortical blindness of Tumbelaka's patient. In one of Fischer's cases there were times when even strong illumination failed to give any reaction, a sign which he attributed to defect of attention. But Tumbelaka, in the light of his own case, thinks it highly probable that this transient amaurosis was due to the occasional abolition of function of the central optic system following on an irregular course of the destructive process. This opposition to Fischer's interpretations and theories concerning the clinical experiences of others is by no means intended as implying any doubt as to his clinical observations on his own patients. With his very ample clinical history he has made it clear how severe disturbances of attention can, in certain cerebral relations, give reactions which on superficial examination can very easily alternate with ordinary aphasic symptoms. Far too little attention has been paid to this experience of Fischer by other observers. From my study of the literature, writes Tumbelaka, I have not formed the conviction that the necessary attention has been given always to the influence of disturbances of attention on the reactions in speech, gnosis, and praxis. Study of these cases shows further that the increasing psychical decay goes hand in hand with a gradual decline of the somatic condition. The severely demented patients of Frey (case 1), Perusini (case 1), and Fischer (case 2) died in marasmus. One of Alzheimer's, one of Perusini's, and Tumbelaka's case died of pneumonia which appeared after the general condition of the body was already greatly reduced. One of Fischer's cases died from a phlegmon, Bielschowsky's in deep coma, Sala's from enterocolitis. In some cases bedsores appeared before the end. Chronic nephritis is mentioned by Lafora, Fuller, and Barrett. As to the age at the onset, we find the youngest is Barrett's patient (thirty-three); then comes Fuller's (thirty-four), and one of Perusini's (thirty-seven). The commonest age was between forty-five and sixty. The age was still higher in the cases of Redlich, Alzheimer, Perusini, Frey, and Fischer. The average duration of the disease was about four years, and it varied between two and one half and eight years. Many observers have attempted to separate this disease from other psychoses. Fischer has grouped the psychoses of advanced life as follows: (1) cases with sphaerotrachia and clinical symptoms that can easily be put into a special group; (2) senile cases without sphaerotrachia and without the symptoms of group 1; (3) cases showing similar symptoms to those of group 1, in whose brains there were extensive and mostly multiple cerebral softenings, which in two of his cases were accompanied by severe diffuse atrophy of the cortex. The symptom complex which he regarded as typical of his group 1 consists of a severe progressive dementia whereby presbyphrenia, delirium, Korssakow's condition, and paranoid symptoms appeared. In this division we see thus a great classificatory value put upon the sphaerotrachia. Fischer therefore calls it a specific disease of the brain whose chief anatomical morbid signs are the plaques (his "drusen"). It was because of the presence of plaques that he included

his four cases of Alzheimer's disease in this group and called them presbyophrenic dementia. The distinction between the clinical picture described by others and his presbyophrenic symptom complex he has regarded as a faulty observation of Alzheimer, Kraepelin, and others. Fischer's idea of presbyophrenic dementia is identical with what he calls the plaque disease (*Drusen-Krankheit*). As, according to him, sphaerotrichia does not occur in normal advanced life, his presbyophrenic group contains (1) cases which clinically would still be reckoned by many among the normally advancing age, in which plaques are found; (2) cases which others count as ordinary senile dementia; (3) cases of presbyophrenic dementia in Wernicke's sense, in which plaques are found; and (4) Alzheimer's disease. Those observers who claim that they have found plaques in psychically normal old age must, according to Fischer, have failed to give sufficient attention to the mental condition of the examined cases. If this had been done, he says, the presence of plaques would have been seen by the symptom complex, his own presbyophrenic dementia. Tumbelaka, from his own experience, agrees with those who have found plaques in cases of psychically normal old age; no surprise need be felt at this, for as a rule central nervous system processes have to reach a certain degree before clinical manifestations are present; the clinical picture depends not only on the patient's cerebral and psychical constitution, but also on the nature, rapidity, and localization of this process. By Alzheimer and others the above-named cases have been called an atypical form of senile dementia; he looks on the plaques as ordinary expressions of the senile involution which has the same diagnostic value for senile dementia as plasma-cells for the recognition of paralytic dementia. Alzheimer maintained this attitude on account of the simultaneous occurrence of all the cerebral symptoms of senile nature, such as the plaques and fibril-degeneration together with the atrophy, sclerosis, and lipid changes in the ganglion cells, and glial proliferations. Against this standpoint of Alzheimer, Tumbelaka remarks that Barrett, Perusini, and others, including himself, have failed to find any of the symptoms belonging to old age in the body apart from the central nervous system. Commonly we see in old age various changes involving almost the whole of the organism; and in some forms of internal secretory disturbances we see infantilism or senility expressed in the whole bodily and psychical organization of the individual. Tumbelaka thinks it is better not to speak of Alzheimer's disease as a senile dementia. We have seen that in Barrett's case it set in at a period of life that had not even reached the presenile age.

As a provisional classification of this still so little understood disease Tumbelaka offers the following remarks: The Redlich-Alzheimer disease is a condition of dementia which is the sequel of a morbid process that produces profound changes in the cerebral cortex, among which the plaques are the most striking feature, at any rate in silver preparations. In like manner, in arteriosclerotic conditions we may have in a given case

a similar degree of changes with resulting clinical symptoms. As with arteriosclerosis, so with plaque-formation we see that it occurs by preference in the senile and presenile periods; just as arteriosclerosis can occur before even the presenile period, so also can plaques occur in early life, but extremely rarely (as in Barrett's thirty-three year old patient). Except for the influence of age, we do not yet properly know what are the predisposing causes of this disease. In the cases of Janssen, Perusini, and Tumbelaka the patients showed a condition of cerebral inferiority. The abuse of alcohol was present in only two cases. Lues appears to play no causal part. Among changes in viscera, we find chronic nephritis mentioned by Lafora, Fuller, and Barrett. Perusini found in one of his patients indications of the occurrence of disturbances of internal secretion. In Tumbelaka's case there was an important diminution in size of the thyroid gland. But, as a general rule, far too little attention has been paid to the organs of internal secretion. As to the blood-vascular system, unless there be nephritis present, the course of plaque-formation is as good as wholly unattended by vascular changes, apart from the tortuous course or even the obliteration of some of the vessels in the cerebrum; and these latter changes must be regarded as due to the direct influence of the plaque-formation. Janssen and also Redlich have mentioned small cerebral vessels showing homogeneous little spots on their walls. But in general we may say that cerebra with many plaques, of even great age, do not give pronounced vascular changes. As to the position of Alzheimer's disease in the series of psychoses, Schnitzler has recorded the case of a mentally backward but well-behaved woman who had had four children; two were healthy, the others had died; the second of the latter two was premature. Lues could be excluded. When the mother was thirty-one, she became very quiet and showed a great need for sleep after the birth of her fourth child. Her grief at the loss of her child was of less than the normal duration; she became disinclined to work, her indolence steadily increased, and she became less interested in her surroundings. She behaved childishly, laughed much, fouled herself, and mixed up her children. There were no attacks of irritability or of anxiety. Her aspect was pasty, the skin myxœdematous, she was fat and showed marked foldings of the skin, her arms and legs being a worm-shaped mass; the skin pitted on pressure. The hair was reddish and rather scanty; several molar teeth were carious; the speech was often slow. Her chief psychical symptom was a progressive apathetic dementia. A transient facial paresis and severe bulbar symptoms appeared. There was no question of any aphasia or apraxia. The pathological anatomy in this case greatly resembled that of the above-mentioned ones, but there were no plaques present. Great numbers of ganglion cells with the Alzheimer fibril-degeneration were found. A similar histopathological picture was seen in a case, recorded by Frets, in a forty-eight year old man, and Alzheimer had earlier seen a similar condition. Tumbelaka thinks that this case of Schnitzler must be put into a separate group from the

Redlich-Alzheimer disease, for if it were identical with the latter we should expect to have transitional anatomical forms. Up to the present time these have not been seen, and we still have to do with cases in which the Alzheimer fibril-degeneration appears without plaques. We do not know of any cases showing fibril-changes with the presence of a few plaques, so that meanwhile it seems more plausible to regard the Schnitzler clinical picture as an expression of an independent process and not as a variation or an atypical form of the Redlich-Alzheimer disease. From all that has been said, it is clear that the diagnosis of Alzheimer's disease is so difficult that only pathological anatomy can solve the problem. If we see a progressive dementia, with intermittent Korssakow-like signs and neurological destruction symptoms, we may well think of the possibility of this disease; especially, aphasic symptoms of intermittent or remittent character, and increasing spasm are not lacking in fully developed cases. Quantitative reflex changes are present; in one case also qualitative were found. Sluggish reaction of narrowed pupils has been seen in many cases. Tremors generally occur, but disturbances of coördination seldom. In a small number of cases epileptic attacks have occurred, especially when the dementia has become very great. The dementia can be complicated by all sorts of cortical destruction symptoms. In cases, such as those of Redlich, Barrett, and Tumbelaka, in which the morbid process has severely disturbed the functions of a particular part of the cortex before the appearance of the dementia or other signs, there is great danger of mistaking the true nature of the disease. The distinction from Schnitzler's disease, however, can only be provisionally possible during life, even in far advanced cases after long observation. Alzheimer has pointed out the difficulty, or rather the impossibility, of differentiating his disease from paralytic dementia, if in the latter the luetic reaction is not strongly positive. The occurrence of sensory aphasic symptoms resulting from a particularly marked localization of the destructive process in the first temporal and the supramarginal convolution in Tumbelaka's case bears out to the full Alzheimer's experience. In the differential diagnosis between Alzheimer's disease and arteriosclerotic dementia we have no headache or vertigo in the former while they are present in the arteriosclerotic Alzheimer conditions. Only one case (Lafora's) complained once, early in the disease, of vertigo, but the disease was here complicated with a nephritis. Similarly, Tumbelaka's patient spoke of giddiness at the onset of his illness, but not afterward. Finally, says Tumbelaka, the occurrence of a large number of apoplectic or of epileptiform attacks points more to an arteriosclerotic process, because in the Redlich-Alzheimer disease the attacks occur mostly sporadically, and then only in an advanced stage of the disease.

(Tumbelaka gives a list of twenty-four references to the literature of Alzheimer's disease. One misses, however, any mention, there and in the text, of Ziveri's case, *Rassegna di Studi Psichiat.*, 1913, III, p. 187, and of Lambert's five cases, *Psychiat. Bull. of New York State Hospitals*, 1916, IX, p. 513.) [Leonard J. Kidd, London, England.]

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY: THE NEUROLOGY OF METABOLIC PROCESSES.

1. VEGETATIVE NERVOUS SYSTEM.

Sicard and Paraf. OCULOCARDIAC REFLEX AFTER NEUROTOMY. [Bull. d. l. Soc. Méd. d. Hôp., Dec. 10, 1920, XLIV, No. 38.]

These authors report on the findings in three patients who had had the trigeminal nerve severed to treat an obstinate tic douloureux. The oculocardiac reflex was abolished on the operated side while it persisted on the intact side. They accept this as demonstrating that the trigeminal pathways are involved in the reflex.

Shea, J. J. PROTEIN SENSITIZATION IN VASOMOTOR RHINITIS. [Tenn. State Med. Assoc., Oct., 1921.]

The term anaphylaxis was coined to contrast it with prophylaxis. The modus operandi involves speculation. Briefly, it is produced by a combined action of the sympathetic nervous system and the endocrinal secretions, "from a state of hypersensitiveness that is due to the presence in certain tissues of specific antibodies, the symptoms of anaphylaxis being caused by the meeting of these antibodies with the respective antigens in these tissues." (Tice, Medicine.)

That the sympathetic system controls secretions and vasomotor action is firmly established, but the stimulation of its action is unknown. Experiments have shown that endocrinal secretions will alter this sympathetic action. An animal may be immunized by inoculation with graduated doses of bacteria or virus to a state of prophylaxis against an infection of that germ. The same animal upon inoculation of graduated doses of a foreign protein may become sensitized to that protein, and further injections of that protein will produce anaphylaxis, or allergy. Inspection of the nasal membrane in vasomotor rhinitis excludes the presence of any inflammatory condition. On the other hand, the pale, cyanotic oedema bespeaks a lack of the fighting reaction. If the membrane lining the lower respiratory tract could be studied during an asthmatic attack, it would appear the same. The phenomenon is not limited to these membranes, but may be observed wherever sympathetic nerve control can be studied. The pupil may be dilated by the direct action of horse serum on the eye of a sensitized rabbit. Dilatation of the intra-ocular vessels with hemorrhages and oedema of the conjunctiva

and lids accompany the more vigorous reactions. How does the protein enter the individual, and why this atypical reaction? The only answer to this is that at some previous date during the assimilation of the end products of digestion, they have retained their own characteristics and act as foreign protein. Maybe they were absorbed before the end stage of digestion had occurred. The system then produced antibodies for these native proteins, and upon each subsequent injection a fight is staged with an alteration of the endocrinal secretions which in turn disturb the action of the sympathetic system. Thus, anaphylaxis, or allergy is produced, and if the nasal membranes are mostly affected, we have a vasomotor rhinitis established, or if the respiratory membranes sustain the attack an asthma is present.

The sympathetic control of the nasal membrane occurs through the naso-palatine ganglion (Meckle's) and cocainization of this ganglion will reduce oedema of this tissue, proving the influence of the sympathetic over this phenomenon. The isolation of the offending protein is to be sought and the subsequent desensitizing of the individual. If the protein cannot be isolated, two methods of attack may be chosen. First, stimulation of the endocrinal secretions by the administration of either thyroid glands or mixed glands tablets; or, based upon the idea that after all this could not occur in a healthy nose, the administration of an autogenous vaccine made from the nasal flora. Under the endocrinal treatment I wish to recommend its application in the mild cases causing a blockage of the Eustachian tubes. [Author's abstract.]

Tenji Mashima. STUDIES ON THE VASOMOTOR NERVES OF THE LUNG OF TOADS. [Japan Medical World, Vol. I, No. 5, P. I., 1921.]

For artificial irrigation of the lung with Ringer's solution a cannula was inserted into the bulbus arteriosus from the internal surface of the ventricle. All the great arteries with the exception of the pulmocutaneous artery are ligated and the great cutaneous artery is ligated and then only the pulmonary artery remains as the way of circulation. Two pulmonary veins unite with each other and open into the left auricle. The other veins except the pulmonary were ligated at the opening and the cardiac branches of the vagus nerves were also cut near the sinus venosus. Another cannula was inserted into the left auricle. When the animal was thus prepared the perfused fluid flowed from the bulbus arteriosus through the great arterial trunk, pulmocutaneous artery, pulmonary artery, lung, and pulmonary vein, the left auricle and lastly through the cannula flowed away. The rate of the flow in this circulatory system is measured by recording the number of drops of the fluid flowing out through the auricular cannula. The arterial cannula is combined by the rubber tube with a Mariott bottle containing Ringer's solution.

On the specimen thus prepared were experimented the stimulation of

the sympathetic nerve and of the vagus nerve and the action of adrenalin, muscarin, atropine, etc. In these experiments the author observed principally the variations of the number of drops responding to the manipulation and reached the following results:

1. The artificial irrigation of the circulatory system of lung of toad used in my experiments can be used as one of the methods for biological standardization of adrenalin, but practically it is inferior to Lâwen-Trendelenburg or Ehrmann methods.

2. The pulmonary vessels of toad are contracted by the action of adrenalin. The minimum amount required to produce this action is much larger than the amount required to produce the same action in the vessels of the lower limbs.

3. The smooth muscles of toad's lung are stimulated by the vagus nerves and their contraction indirectly disturbs the circulation, functionally they correspond to the bronchial muscles of mammalian animals.

4. There are two causes to raise the resistance of the vascular system of lung of toad: One is the direct contraction of the vessel wall, and the other is the indirect action of contraction of the smooth muscle in the lung. The former is produced by the action of adrenalin and the latter by the action of muscarin. As to the stimulation of vagus, both effects are produced simultaneously.

5. It is undoubted that vasoconstrictor nerves in the lungs of toad exist and that they belong to the sympathetic nerve. It is not known through which of the cerebrospinal nerve-roots this sympathetic fiber arises but it must flow out either from the second spinal nerve or the vagus nerve, more likely from the latter one. [Author's abstract.]

Scholtz, Moses. PSYCHOGENIC AND NEUROGENIC FACTORS IN SKIN DISEASES. [Medical Record, August 6, 1921.]

Psychogenic factors in skin diseases can be either the effect, or the cause. As the first, can be mentioned mental depression and hypochondriacal state often developing in chronic itching or disfiguring dermatoses; as the second, deserve mention Dermatitis Factitia in hysterical subjects and Neurotic Excoriations in nervous individuals. The incidence of various skin lesions in various psychoses and their possible pathogenetic relationship is only casually recorded and hardly at all studied.

Neurogenic factors proper. The source of intimate connection between the nervous system and the skin is to be found in their embryologic relationship, as they both develop from the ectoderm. With the exception of the brain and of the spinal cord, the skin possesses the richest nerve supply of any organ, both in the number of nerve fibers and in their functional variety. Nervous Pruritus is the purest type of skin neurosis. Winter and bath pruritus are some of its varieties.

Reflex and sympathetic skin symptoms. Here belong a casual sudden

disappearance of benign growths, like warts; also sympathetic disappearance of warts from one side of the body after warts of the other side disappear under exposures to X-ray. The radiation of itching and the projection of various skin paraesthesias on the surface from the internal organs, such as the prostate and ovaries, are the examples of true reflex neurodermatoses. Among commonly occurring neurodermatoses two groups are standing out: Herpetic Group to which belong herpes zoster, herpes simplex and dermatitis herpetiformis, and Lichen Group to which belong different varieties of Lichen Planus and Lichen Simplex, *i.e.*, Neurodermitis of the French authors.

From the point of view of the pathogenesis neurodermatoses can be conveniently divided into following groups: (1) Functional group in which skin lesions develop on the bases of general nervous irritability, exhaustion or toxæmia. Here belong nervous pruritus, lichen planus and dermatitis herpetiformis and functional disturbances of the sweat and sebaceous glands; (2) Vasomotor group—here belong erythromelalgia, angioneurotic oedema and spastic anemic forms, the extreme type of which is Raynaud's disease; (3) Trophoneurotic group—here belong idiopathic skin atrophies, disturbances of pigmentation, both those with superfluous deposit and the loss of pigment. alopecia areata, indolent and perforating ulcers, scleroderma, etc.; (4) Endocrinopathic dermatoses, the most recent and the least understood group—here belong hypothyroid and hyperthyroid skin syndromes, Addison's bronze discoloration, etc. [Author's abstract.]

Thursfield and Paterson. DERMATO-POLYNEURITIS AND ERYTHRO-OEDEMA.
[Brit. Journ. Child. Dis., January-March, 1922.]

The case of a previously healthy female infant, aged ten and one-half months, who was suddenly attacked by an undiagnosed, probably febrile infection is here reported upon by these observers. After some weeks of fretfulness and anorexia the child developed cutaneous, neuromuscular and mental symptoms resembling in many respects the condition seen in some cases of epidemic encephalitis. The face showed two patches of color on the cheek and a reddened nose with a patch of branny desquamation on the forehead. There was a slight erythematous rash on the buttocks. The extremities were cyanosed, slightly oedematous, and cold, with the skin peeling off the fingers in large flakes; the finger-nails were not affected, but the toe-nails appeared to be deformed by the inflammation. The redness, cyanosis, and desquamation were limited to the hands and feet, the skin above the wrists and ankles having an almost normal appearance. The skin lesions obviously caused a good deal of irritation, but not so much as in eczema. Neuromuscular involvement was shown by tonelessness of the muscles and extreme slowness of all muscular movements, but there was no tremor nor incoördination. When awake the infant kept up a slow, continuous movement, falling forward on the face

and then slowly raising her head and bringing herself into a sitting position with a circular movement. The writers point out that an identical or closely allied disorder was described by Swift of Adelaide in 1914, and more recently by Jeffreys Wood of Melbourne, and in the United States by Weston, Byfield, and Manning Field. Thursfield and Paterson prefer the term "dermato-polyneuritis" to that of "acrodynia" used by Byfield, since the latter term ignores the neuromuscular and mental symptoms. The condition is usually regarded as a "deficiency disease" or as a post-influenzal polyneuritis. The prognosis is good, complete recovery being the ultimate result. In the present case death was due to acute intussusception, and the autopsy failed to reveal any gross abnormality. Parkes Weber (*Ibid.*) reviews the literature, and records with illustrations a case of erythro-oedema which apparently commenced in the first month of life and lasted till death at three and one-quarter years of age. The cheeks, chin, nose and ears were affected as well as the hands and feet. The soles were red, slightly desquamating, and deeply ulcerated. The hands were mutilated by the loss not only of nails, but of portions of fingers also. [B. M. J.]

Monrad. TREATMENT OF THE EXUDATIVE DIATHESIS. [*Acta Ped.*, Dec. 15, 1921, I, No. 3.]

This author's hypothesis that the exudative phenomena are in some matter related to faulty fatty metabolism is further discussed in this paper. He gives a number of clinical reports tending to show the benefit that follows exclusion from the diet of all forms of animal fat, including cream, butter, bacon, egg yolk and fat meats of any kind. For infants under a year he forbids the feeding of breast milk and whole cow's milk, allowing only skimmed milk and skimmed milk soup, oatmeal and other gruels, soft mashed potato, apple sauce, etc. For older children he cuts out whole milk, cream, butter, bacon and other fat meats, allowing only skimmed milk, soups, vegetables, gruels, porridge, fruit, honey, marmalade, lean meat, and cocoa and other vegetable fats. No cod liver oil should be taken. Overfeeding is not especially harmful in the exudative diathesis; the danger is from either small or large amounts of animal fat.

Alessandri. CASE OF QUINCKE'S EDEMA WITH URTICARIA. [*Rivista Critica di Clinica Medica*, May, 1921, XXII, No. 16.]

This patient of eighteen had a father who was a hard drinker. The son had always been healthy until in 1919 he was jailed for twelve days on account of noisy conduct. Since then he has had recurring angio-neurotic edema with intense pruritus and urticaria. This was rebellious for months to all treatment until 0.5 gm. of peptone was given by mouth half an hour before each of the three meals of the day. Following this the exudative tendency gradually subsided and had ceased for four months at the date of this report.

Nario, C. ANGIONEUROTIC EDEMA. [Revista Méd. del Uruguay, Sept., 1921, XXIV, No. 9. J. A. M. A.]

Nario's patient has been having these attacks for nearly fifteen years. Pain is the main symptom. It begins in the precordial region and slowly spreads to the right, and persists almost unbearable for twelve or eighteen hours. It is followed by extreme depression, requiring caffeine, camphor or other stimulants. The woman can tell a few hours beforehand the onset of an attack. They occur less often and are milder in warm weather. Fleeting edema at various points testified to the angioneurotic nature of the process, the pain being evidently the result of edema in the internal organs, causing the erratic visceralgias in the intensely vagotonic state. No benefit was derived from organotherapy, and he warned the family of the possibility of edema of the brain and of the glottis. Later, an attack of sudden symptoms resembling those of grave uremia yielded promptly to venesection and lumbar puncture, realizing his prognosis.

Monrad, S. CAUSE OF EXUDATIVE DIATHESIS. [Üges. f. Laeger, Nov. 10, 1921, LXXXIII, No. 45. J. A. M. A.]

Monrad Crohn prefers to call this disturbance the exudative-lymphatic diathesis. He encountered it in 4.5 per cent of 2772 hospital patients, and in 6.9 per cent of 2934 private patients, 1917-1920. Only 14 of the total 327 children were over ten, confirming that children outgrow the tendency. It is familial, hereditary and congenital. The skin and mucosa symptoms disappear first; the asthma and hypertrophy of the tonsils may persist for years. The prognosis is good except for the danger of sudden death in the eczema stage and the so-called thymic death. He had a case of the latter, a male infant of 18 months dying suddenly a day or two after herniotomy, and necropsy disclosing nothing abnormal beyond the hyperplasia of the thymus, spleen and intestinal follicles. When an endemic acute infection develops in the hospital, the children of this exudative type are sure to contract it. His research and extensive experience indicate that excluding animal fat from the food hastens the throwing off of the condition, and the children thrive and grow robust. He therefore incriminates animal fat as the factor responsible for the exudative-lymphatic diathesis. The animal fat in some seems to behave like an actual poison. Treatment therefore should aim to exclude cream, butter and animal fat of all kinds, including cod liver oil, while vegetable fats can be freely allowed. The animal fats must be avoided for six months even after apparent recovery, or the symptoms may return. Under the dietetic treatment, adenoid vegetations are liable to subside with the other symptoms of the diathesis. In 68 of the children, operations on adenoids (55) and on the tonsils (13) were not followed by the least improvement. Only when the dietetic treatment was kept up perseveringly the benefit realized.

Dubreuilh. CIRCUMSCRIBED SCLERODERMA AND EXOPHTHALMIC GOITER.
[Bull. de la Soc. Franc. de Dermat. et de Syph., 1921, p. 221.]

A woman fifty-three years of age suffering for five years with pronounced Basedow. In the last two years there have developed two symmetrical, oval plaques located upon the anterior and outer side on the thighs, slightly livid, uniformly firm, with unaltered surface.

Joetrain, M. E. URTICARIA FROM FATIGUE AND COLLOIDOCCLASIS.

Urticaria is one of the manifestations which is produced by the phenomena of colloidal disequilibrium to which Widal, Abrami and Brissaud have given the name of colloidocclasis. This symptom has appeared most frequently in consequence of a shock produced by the penetration into the organism of heterogeneous substances. One of the most frequent examples of similar facts is the urticaria of alimentary origin in the course of which we, with these authors, have found that which we have designated by the name of "hemoclastic crisis" characteristic of the states of shock. But beside these urticarias produced by the introduction of heterogeneous protein, there are others which may appear after an attack of paroxysmal hemoglobinuria or after an intravenous injection of a solution of chlorurea or of arsenobenzol.

The authors have observed a case in which the shock, of which the urticaria was the only evidence, appeared not now under the influence of cold, but after fatigue and effort. It is the first case according to our knowledge where one might observe a muscular fatigue provoking in the organism a hemoclastic shock followed by the appearance of urticarian plaques. The patient who was the object of this study was a woman thirty-two years of age and had been subject since the age of twelve years to crisis of generalized urticaria. The attacks appeared first after varicella. A number of physicians consulted attributed these attacks to intestinal and stomach changes. We made with this patient a series of experiments for determining the cause of these crises and we succeeded in discovering the origin. We began to investigate the hemoclastic shock after a meal containing animal albumins. The hemoclastic shock was very plain, but the patient did not present urticaria. Our attention was directed to the fact that one evening on arriving, having fasted for 24 hours, the patient, who had hurried for fear of being late, had on her body a number of urticarian plaques. As we inquired into the matter she told us that she had already noticed that these crises appeared after walking rapidly. She recalled also that she had been obliged to give up tennis and golf and could not climb or perform violent exercise without having soon an intense itching and a generalized urticaria. It was interesting therefore to verify these facts. We had our patient walk for half an hour at a very rapid pace without having taken any liquid or any nourishment and upon her return we determined in her a drop in

white corpuscles 19,500 to 3000, a fall in arterial pressure from 15.9 to 12.9, a relaxation of the refractometric index, a very clear modification of coagulation and the presence of albumin in the urine. It is during the course of the hemoclastic shock or some moments after that one may see some dyspnea appear, elevation of temperature and the presence upon the entire body of the large urticarian plaques itching extremely. We renewed this experiment several times and each time according to the nature of the effort demanded we saw appear a hemoclastic shock and a urticarian crisis.

Two most interesting facts were established further with this patient, on one hand the presence of an autoprecipitation of serum at the moment of the shock, on the other the condition of colloidal instability in which the serum of this patient was found so that a single intravenous injection of sodium chlorid was able in her case to determine a slight hemoclastic crisis and to permit a urticaria to follow. It is this method of therapy which we tried with this patient with MM. Widal and Abrami and which determined in her entire organism a series of small shocks of desensitization for avoiding the great shock caused by fatigue or effort. It is the first time that one could see the fatigue alone without any alimentation and without the introduction of any foreign elements produce in the organism a hemoclastic crisis followed by urticaria. It is a matter therefore, as in the attack of paroxysmal hemoglobinuria under the influence of cold, of a true autocolloidoclasia, following the expression of Widal, in opposition to the heterocolloidoclasia produced in the organism by the introduction of foreign albumin. [Author's abstract.]

Solomons, B. HERPES AS A TYPE OF VICARIOUS MENSTRUATION. [Dublin Journal of Medical Science, May, 1921, Ser. IV, No. 15.]

This patient, a woman of twenty-seven years of age, had a sore on her left cheek every month. It resembled a catarrhal herpes and remained for about a week. When it is present she gets the sensations which some women feel previous to menstruation. This herpetic eruption began when she was eighteen and has appeared monthly ever since. Absence of the uterus, tubes and ovaries was disclosed by gynecological examination.

Wood. ERYTHREDEMA. [Med. Jour, Austria, Feb. 19, 1921.]

According to this observer this condition is not uncommon. He has observed it in forty patients and he instances its occurrence in fifty-one cases as reported to him by a medical confrère. The symptoms are characteristic. The child holds the head bent down; usually it is whining and fretful. Some patients do not seem able to rest, scratching at their feet or pulling at their hair or ears, frequently making them bleed. If placed on the floor or in their perambulators they will bend their heads forward almost down to their feet. They do not smile, and they resent any attempt

to amuse them. In some cases the red swollen appearance of the hands is an early symptom. These patients become worn out for want of sleep and in absolute distress from the intolerable irritation of the skin of body, hands and feet. Sometimes they are vicious, scratching and biting at their mother or nurse.

Painter, C. F., and Bean, H. C. HEREDITARY EDEMA. [Boston Medical and Sur. Journal, May, 1921, CLXXXIV, No. 19.]

These authors class this syndrome as an endocrinopathy. If such cases are congenital, then there must be an inherited insufficiency or hypersecretion of some or all the endocrine glands. They do not analyze the cases to their ultimate sources apparently.

Lereboullet, P. ORGANOTHERAPY IN SCLERODERMIA. [Bull. d. l. Soc. Med. des Hôpitaux, July, 1921, XLV, No. 26.]

In the extreme case of sclerodermia described, at the age of seventeen the face seemed to be a wax mask; the cheeks looked as if glued to the skeleton. The neck was hard and rigid, and it was impossible to take up a fold in the skin on the chest. The hands were bluish and the fingers immovably pressed against the palms. The upper part of the arms seemed the only regions that escaped the severe sclerodermia. Under treatment three years later with thyroid, pituitary and suprarenal extract simultaneously—all of which seemed to be called for by certain symptoms—plus phosphoric acid and arsenic tonics, marked improvement was realized even in two months, and by the age of twenty-four the sclerodermic condition and infantilism had entirely disappeared, the general aspect of the young man being now normal. [J. A. M. A.]

Weil, E., and Plichet. HYPERTRICHOSIS AND DIABETES. [Presse Méd., 29, 1921, 4.]

Hirsutism in women may be part of a pluriglandular syndrome, in the course of which there might develop glycosuria. The author's case occurred in a woman thirty-eight with well-developed beard, who succumbed to an intense saccharine diabetes. The patient also had pulmonary tuberculosis, the stage and degree not being given. Autopsy showed no tumor of the adrenal and the only glandular lesion was sclerosis of the ovaries. The totality of endocrine manifestations was the male distribution of hair in part (beard), virilism (no details), obesity, diabetes. The relationship is obscure and one can only compare this with similar cases. Tuffier and Guémès have reported cases of hirsutism in which the women showed respectively mild glycosuria and well marked saccharine diabetes. The latter readily yielded to diet and probably should really be regarded as glycosuria. Two other cases of hirsuties in women (patients of Laignel-Lavastine) were examined carefully for sugar in the urine, but although none was ever found, tests for

carbohydrate tolerance showed that this was impaired, while artificial diabetes could be readily provoked by injecting adrenalin and thyroïdin. There seems therefore to be an undoubted connection between feminine hypertrichosis and glycosuria, while obesity may also be associated. The rationale of these cases is not entirely apparent, but in virilism we should certainly suspect the adrenals.

Curschmann, H. SCLERODERMIC DYSTROPHY. [Med. Klinik., Oct. 9, 1921, XVII, No. 41.]

Pluriglandular disturbances were manifest in these six cases of scleroderma in men and women of all ages. Curschmann states that there is much evidence to sustain the assumption that the skin itself has endocrine functions. The sclerodermic dystrophies are particularly instructive from this point of view. They and the predominantly neuromuscular forms of dystrophy, and the primary vasomotor neuroses should be investigated from this viewpoint.

Gutmann, R. A., and Dalsace, T. UNILATERAL MELANODERMA. [Bull. d. l. Societe Med. des Hop., July, 1921, XLV, No. 24.]

This patient had pronounced pigmentation of the abdomen and chest distributed in a manner similar to the anatomical localizations of the sympathetic system as evidenced by a simultaneous involvement of the sympathetics of the vessel and sweat mechanisms.

Freund, E. PHYSIOLOGY OF SWEAT SECRETION. [Wien. kl. Woch., November 11, 1920.]

Freund has made certain observations in investigations on epinephrin iontophoresis. On the back of his hand, he produced by means of an epinephrin solution (1 : 50,000) from the anode an anemic area corresponding to the field of the electrode. The current was 3 milliamperes, applied for five minutes. The skin area corresponding to the field of the electrode was ivory white and dry, and occasionally goose flesh appeared after the electrode was removed. This hand was then put in a hot-air chamber, in order to observe the behavior of the anemic skin area under the influence of heat. When the heat had been applied for several minutes, the anemic area became covered with heavy drops of sweat, whereas the rest of the hand, although intensely reddened by the heat, had scarcely become moist. The intense secretion of sweat was sharply confined to the anemic area although at times there were contradictory results.

Weidman, F. D. NECROPSY FINDINGS IN CASE OF CONGENITAL SCLERODERMA AND SCLERODACTYLIA. [Archives of Derm. and Syph., Chicago, April, 1920.]

The author makes a diagnosis in this case depending partly on the clinical features, but more on the microscopic findings. The disease

which occurred immediately after birth, was associated with a fatal hemorrhagic diarrhea. The skin induration in this 15-day-old child, probably syphilitic, suggested scleroderma neonatorum. It was, however, symmetrical and periarticular, and the induration was found to be purely subcutaneous.

Henrichs, J. HEREDITARY MENTAL AND SKIN ANOMALIES. [Norsk Magazin for Laegevidenskaben, October, 1920.]

The author tabulates the genealogic trees of a number of families in which an inherited taint is displayed in idiocy and ichthyosis in each generation. The records show from eight to sixteen members in each family thus affected in the course of four or five generations. In discussing the mechanism of this hereditary taint, he is inclined to incriminate the endocrine system and the thyroid in particular.

Ramirez, M. A. PROTEIN SENSITIZATION IN ECZEMA. [Arch. Derm. and Syph., September, 1920.]

The author has tested a large number of individuals with eczema for their reaction to foreign proteins. Of thirty out of seventy, eight gave positive skin tests. He says that like asthma, eczema which shows anaphylaxes occurs more frequently in young people. Eczema which is associated with hay-fever or asthma he believes is anaphylactic. According to his studies only a small percentage of eczemas are anaphylactic. Nevertheless it is essential that patients be tested thoroughly.

Alderson, R. SEVERE ANGIONEUROTIC EDEMA. [British Med. Journ., June 19, 1920.]

The author reports a case of a boy, aged three years and ten months, who complained of pain in the left leg, which the mother noticed had become swollen. When he saw him on the following day the limb was edematous and painful from the toes to the lower third of the thigh. The boy was fretful and the temperature was 101° F. Two days later the child was quite sick—temperature 101.5° F.—and, in addition to the lower limb, the left forearm and hand were edematous and also the lower part of the back. Next day the swelling had completely disappeared from the limbs, but the right side of the scalp was intensely edematous, extending to the eyelids, which were completely closed. On attempting to open the lids a blood-stained fluid spurted out with some force; the conjunctiva was purplish in color. Next day the whole scalp was involved, and both eyes were closed and oozing sanious fluid; the swelling in the left forearm and hand had returned. During the following night there was a copious evacuation of bright blood from the rectum—about half a pint. Recovery now rapidly ensued; in two days the swelling had entirely disappeared, and the child appeared quite well. The temperature throughout remained at 101° to 101.5° F.; the urine was scanty and loaded with urates; the tongue was dry and the condition

was somewhat alarming, especially as he complained of some fullness in the throat. Had this type of edema invaded the larynx, the condition would have become immediately dangerous. Treatment consisted in the administration of calomel and salines, followed by calcium lactate, 10 grains every two hours. Recovery appeared to follow the use of the last-named drug in such a way as to suggest that it had an influence on the condition; and in future cases I should begin it at the outset. The possibility of laryngeal invasion was, of course, prepared for. The child was of an intensely nervous type, and reacted acutely to insect bites.

Kramer, S. P. REPRESENTATION IN THE CEREBRAL CORTEX OF THE PERIPHERAL BLOOD VESSELS. [Contributions to Medical and Biological Research, Osler, 1919, II, 857.]

In a previously recorded case of cortical tumor, Kramer had noticed that while removing the growth the crossed radial pulse became perceptibly weaker and remained so for some hours after both first and second stages of the removal. He has since observed a similar phenomenon in two cases of gunshot wound of the cortex, the difference amounting to as much as 20 mm. of mercury. In a series of observations on dogs, Kramer found that stimulation of the leg area of the motor cortex causes a general fall of blood pressure, and in addition a localized fall in the opposite leg. This he determined by dividing the femoral artery on both sides and measuring the pressure directly. By alternate stimulation of the two leg areas, crossed alternating depression of the blood pressure was registered in the femoral arteries. The fall in pressure appears to be due to a local dilatation of the vessels of the crossed limb. [Walshe. Medical Science.]

Holmes, Gordon. PAIN OF CENTRAL ORIGIN. [Contributions to Medical and Biological Research, Osler, 1919, I, 235.]

The rarity with which lesions in the central nervous system cause pain, compared with the relative frequency with which injury and disease of peripheral nerves do so, has naturally given rise to a belief that central nervous lesions are painless unless they also involve the meninges or the peripheral sensory structures.

However, within recent years, clinical investigation has revealed that lesions affecting certain of the central nervous organs may arise to peripherally referred pain. In the case of the thalamus we have the best-known example of this. Dejerine and Roussy first described the "syndrome thalamique," in which from disease affecting the lateral and posterior parts of this organ there results persistent or paroxysmal pain, often of great severity, referred to the affected half of the body or to some part of this. An over-reaction to affective stimuli is a characteristic feature of this syndrome.

Head and Holmes, working together, have concluded that these pains

and this excessive uncontrolled reaction to certain forms of peripheral stimulus depend not upon an irritative lesion of central conducting paths, but upon the removal of the control normally exerted over the thalamus by the cerebral cortex.

Pain of medullary origin is very rare, but during the war Holmes observed a few cases of spinal injury in which pain could not be ascribed to root irritation. This was seen in cases of concussion with or without slight direct injury of the cervical enlargement of the cord.

In these the pain is intense and burning in character. It is never strictly radicular in distribution, but more diffuse, spreading down the arms and over the shoulders and part of the chest. Though generally constant, these pains are increased by peripheral stimuli, particularly by movement of the painful parts. While they endure they are of intolerable severity, and commonly overcome the patient's fortitude. Fortunately they seldom last for more than three or four days before they begin to abate in severity, to cease in about three weeks. Holmes discusses the reasons which have led him to believe that sensory root irritation cannot account for these symptoms, and one of the more decisive of these is that the pains are sometimes remote from the level of the lesion. Of the 16 cases examined, in 12 there was a partial Brown-Séquad syndrome, in the remaining 4 the symptoms were of moderate severity and bilateral.

In the unilateral cases it was found that the *pain* was on the same side as the paralysis, and not crossed as was the *loss* of pain and thermal sensibility. From which Holmes concludes that the anatomical changes underlying the pain must be in the ventrolateral columns of the side of the cord opposite to the paralysis, where the afferent impressions excited by the stimuli of pain, temperature, and touch are conveyed after their decussation from the side upon which they enter the cord.

On investigating sensation on the paralyzed side, which was the seat of the pains, he found that there was "hyperesthesia" to touch, pressure, pricking, heat, and cold. All these forms of stimulus gave rise to great discomfort, and even to bouts of pain. Further, the threshold of stimulation to these forms of sensibility was not raised in many instances. Therefore the lesion of the crossed sensory paths cannot have been so severe as to interrupt conduction, and the pains may be due to the irritative effects of a slight lesion of these conducting paths.

From the fact that painful sensations may be produced by so wide a variety of stimuli, Holmes suggests that when nerve fibers are injured pain may not be exclusively due to impressions conveyed by the normal pain-conducting paths. Stimulation of any form, if it be of sufficient intensity or mass, may be summated so as to acquire an intensity capable of eliciting actual suffering.

Like the pains and hypersensitiveness of the thalamic syndrome, which they greatly resemble, these of medullary origin may be accompanied by sensations of exaggerated pleasurable when stimuli endowed with pleasurable feeling tone are employed. [Walshe, Medical Science.]

Moutier. VAGOTONIA. [Bull. Méd., Feb. 25, 1922, XXXVI, No. 9.]

Moutier's own experience has been that vagotonia is encountered only in persons with narrow pupils, exaggerated oculocardiac reflex, respiratory arrhythmia, frequent extrasystoles, reacting vigorously to pilocarpin, and displaying a tendency to pains, colics, and sphincter disturbances at the cardia, pylorus, or anus.

Koopman and van Leeuwen. THE CLINICAL SIGNIFICANCE OF THE VEGETATIVE NERVOUS SYSTEM. [Nederl. Tijdschr. voor Geneeskunde, 1921, LXV, April 16, p. 2205.]

The question of the clinical significance of the vegetative nervous system was discussed by J. Koopman and by W. Storm van Leeuwen. Koopman holds that the antagonism between the sympathetic and the parasympathetic system is not established. For some organs, as the kidney, pancreas, liver, and esophagus, it is not even probable. The vagotonia- or the sympathicotonia-complex is to be regarded as non-existent. Pharmacological data are against it, and so also is the fact that, in diseases which ought to depend on vagotonia, sympathicotonic stigmata are constantly met with, and *vice versa*. The reflexes have but little diagnostic value here. But in many clinical conditions, such as fever, appetite, thirst, sweating, pain, the vegetative nervous system plays an important part. The fever depends probably on stimulation of the tuber cinereum; appetite on gastric contractions excited by the mid-brain. In thirst we have esophageal contractions due to excitation of the mid-brain by blood containing an excess of crystalloid substances. Sweating is certainly a vegetative process intimately connected with metabolism. As to pain-perception of organs supplied by the vegetative nervous system opinions still differ. The cervical sympathetic influences the eye, heart, and perhaps the thyroid gland. Basedow's disease may possibly be a sequel of a primary sympathetic lesion. The vegetative system is concerned in bronchial asthma, a general metabolic disease which shows especially an overexcitable vagus nerve; it has points of agreement with the "anaphylactic attack" which also can be brought about by vagotonia. The cervical sympathetic also plays an important part in Sergeant's "mediastinal syndrome." The vegetative system influences the stomach; it is not yet clear what significance its innervation has for gastric ulcer. Diarrhea is often of vagotonic origin; so, too, is hyperacidity. There is an "abdominal syndrome," described clinically and experimentally by Laignel-Lavastine, which in its acute form most resembles cholera, and in its chronic form tabes. While the rôle of the vegetative nervous system is of the greatest importance in metabolism, at present valid conclusions cannot be drawn clinically; the same is true of the vagus- and the sympathicus-neuroses.

Storm van Leeuwen takes the field against the hypotheses of Eppinger and Hess, which he regards as entirely unproved. According to them, the vagus-system and the sympathicus-system are antagonists. Stimula-

tion of the adrenals gives excretion of adrenalin, and this stimulates the nerve-terminations of the sympathetic; they suppose that stimulation of the pancreas—an antagonist of the adrenals—must excrete a poison “autonominine” which stimulates the vagus-terminations, just as pilocarpine does. In order to determine whether a patient is vagotonic or sympathicotonic, they inject pilocarpine or adrenalin, and according to whether an increased sensitiveness to pilocarpine or to adrenalin is present, they diagnose vagotonia or sympathicotonia respectively. The writer strongly combats their hypotheses, but does not deny that the clinical picture of vagotonia is seen. Undoubtedly some persons show a slow heart-beat and conduction disturbances which disappear under atropine. [Leonard J. Kidd, London, England.]

Friedberg, E. VEGETATIVE NERVOUS SYSTEM IN CHILDREN. [Archiv für Kinderheilkunde, Stuttgart, April 5, 1921, LXIX, No. 2.]

The details of various pharmacological tests for the vegetative nervous system as applied to 72 children, including 12 healthy, 5 with spasmophilia, 3 with asthma, 2 with rachitis, and 5 with various disorders of endocrine origin, are here recorded. Friedberg's conclusions are mainly that the results of pharmacological investigation are quite contradictory. The findings in spasmophilia seem to indicate that tetany in children may be quite different from tetany in adults. Normal responses to the pharmacologic tests were sometimes obtained in the severest forms of rachitis. Disturbances of endocrine origin gave conflicting findings, probably from the interplay of several of the ductless glands. The exudative diathesis does not check up as a definite form of vagotonia in the children he examined.

Bolten, H. SIGNIFICANCE OF THE SYMPATHETIC NERVOUS SYSTEM FOR THE ORIGIN OF THE NEUROSES. [Proefschrift, Leiden, Edward Ijdo, 1921.]

In this dissertation Bolten shows how practical experience has convinced him that both in the neuroses of the vegetative nervous system and in the general neuroses the vegetative system largely dominates the clinical picture, and that the essential condition must be looked for in an inborn inferiority of the sympathetic system in the subjects of the neuroses. The conceptions of vagotonia and sympathicotonia (the existence of the latter he denies) have greatly contributed to the notion that in the neuroses a hypertonia of the vegetative system is at work. But we may not speak of a primary tonus increase, but at most of an increased irritability, an abnormal sensitiveness; and he tries to show that this really depends on a hypotonia and an inferiority. The conception “hypotonia” will appear to some perhaps inaccurate, for we cannot speak of a uniform tonus of the sympathetic system. By the term tonus we must understand the intensity of the innervation stimulus. In the sympathetic system this is subject to continual variations, first of all from unceasing

psychical impulses; further, the regulation of the circulation in its various areas, with their changing degrees of activity, requires the continually changing activity of the vegetative organs, and the action of all sorts of external influences, in order that the regulating function of the sympathetic may adapt itself to all these changing conditions. A constant tonus thus by no means exists in the sympathetic system. But the innervation stimulus conducted through that system must have a certain (normal) intensity in order that it may guarantee the normal regulation of the varying vegetative functions and may maintain the equilibrium with the antagonistic autonomic nervous system. It is just this equilibrium that normally exists between these two systems that gives us the right to recognize a normal tonus in the sympathetic system just as much as in the autonomic. The signs of increased vagus-tonus, met with in some neuroses, are held by Bolten to be of secondary nature and to be really dependent on the primary hypotonia of the sympathetic system. The vegetative system cannot be separated from the endocrine gland system so far as its functions are concerned. In the neuroses the inborn constitutional inferiority of the vegetative system, that has remained latent, finds expression. The large group of cardiovascular symptoms, and the trophic disturbances connected with them, depend on an insufficiency of sympathetic innervation. The spastic constipation is interpreted as an expression of sympathicus-hypotonia, and the eosinophilia points to insufficient sympathetic action. And for the metabolism a normal sympathetic regulation of fermentation processes, such as formation of ferments and antibodies, purine-metabolism, and glycogenesis, is of great importance. Also the general muscular hypotonia is certainly to be accounted for to a large extent by sympathicus insufficiency. On this nucleus of symptoms depending on sympathicus-hypotonia we can have added symptoms due to a secondary increased vagus-tonus. Bolten is therefore a strong advocate for the use of thyroid gland preparations in the treatment of the neuroses; they overcome the hypotonia of the sympathetic nervous system and thus restore the equilibrium between the two vegetative systems; the treatment is a rational one. But it needs to be used with caution and over a long period. It is contraindicated when hypertension or organic cardiac lesions are present, but a quick pulse is by no means against its use. Bolten's views are fully justified in this dissertation with regard to cases of hysteria, neurasthenia, migraine, epilepsy, spasmophilia, vasomotor and trophic neuroses, bronchial asthma, orthostatic albuminuria, dysmenorrhoea, and gout. [Leonard J. Kidd. London, England.]

Pottenger, F. M. SYMPATHETIC AND PARASYMPATHETIC SYSTEM BENEFITS. [Endocrinology, March, 1921, J. A. M. A.]

Pottenger directs attention to the fact that the sympathetic nerves and the sympathicotrophic glands of internal secretion aid in the defense of the organism against such condition as enemies from without, infec-

tion, pain, anger, injury, heat, cold, asphyxia, and shock. The parasympathetic nerves and parasympathicotropic glands of internal secretion provide the body with an appetite and the secretions—salivary, gastric, biliary, pancreatic, and intestinal—for the digestion of food, and motor power to the gastrointestinal tube, for mixing the food with the secretions and propelling it onward, and for expelling the refuse from the body.

Tinel. PAIN OF VEGETATIVE NERVE ORIGIN. [La Presse Méd., April 2, 1921.]

Sympathetic (not psychogenic) pains are here discussed. They were found in the limbs, trunk, and face, and he describes in detail six cases in which burning pains and sensations of cold, weight, and fulness occurred in the hand, legs, face, penis, and other parts without any of the more orthodox neurological findings. He compares these sensations in their nature and chronicity to the sensations in causalgia following injury to peripheral nerves and advances arguments to prove that irritation of sympathetic nerves is the cause of these symptoms. He considers that many pains, the cause of which cannot be determined clinically, are due in all probability to sympathetic irritation. He bases his arguments on the fact that in the cases described the sensations were of a kind, *e.g.*, feelings of tension, fulness, weight, and burning heat. Objective signs were absent. The sensations were paroxysmal, had a tendency to become accentuated and to spread, and frequently occurred after excitement and emotion.

Daniélopou, D., and Carniol, A. NEW FACTS SHOWING THE ACTION OF ESERINE ON THE SYMPATHETIC. [Compt. Rend. Soc. de Biol., LXXXVI, April 29, 1922, p. 883.]

The writers have previously shown that eserine is not exclusively a vagotropic substance, as commonly held, but is amphotropic. Its action in normal man, by intravenous injection, shows two phases, an early, quickly on-coming transient sympathicotropic phase, showing acceleration of rhythm and hypertension, and a later, prolonged vagotropic phase of slowing of rhythm and hypotension. Eserine is, thus, an amphotropic substance, with, however, a vagotropic predominance. The writers now show that the initial acceleration of rhythm is due to its action on the sympathetic and not to a paralysis of the vagus, for the vagus remains very excitable during this early phase, as is shown by the great slowing of cardiac rhythm which occurs on applying pressure on the eyeball at the moment of the maximum acceleration. After the injection of eserine the writers find a phenomenon of rhythm which is produced also after the use of adrenalin, *viz.*, sinus arrhythmia in the period of complete acceleration; this is due, not to an exclusive vagus hyperexcitability, but to an excitation of both of these two antagonistic systems. During the phase of acceleration extrasystoles appear, a sign of excitation of hetero-

topic centers. Eserine produces extrasystoles even when the vagus is paralyzed by atropine. [Leonard J. Kidd, London, England.]

Papastratigakis. SYMPTOMS OF SYMPATHETICOTONIA. [Grecè Médicale, April, 1921, XXIII, No. 4.]

This author raises a dissenting voice against some recent reports which state that pilocarpin exerts a tonic action on the pneumogastric, and that the sweating crises do not form part of the actual sympathetico-tonic response. The bradycardia after pilocarpin injection is not due to a tonic action on the pneumogastric but, according to his observations, to a disturbance of the balance between the sympathetic and the pneumogastric by which the vagus action becomes overaccentuated.

II. SENSORI-MOTOR NEUROLOGY.

1. PERIPHERAL NERVES—GENERAL.

Schaffer, K. CHARACTERISTICS OF HEREDITARY DEGENERATION. [Schweiz. Arch. f. Neur. u. Psych., 1920, VII, No. 2.]

The histological characteristics of the diseased tissues found in the familial nervous disorders according to Schaffer are determined by uniform embryologic changes in the central nervous system. Diseases of a familial hereditary type are not only clinically but anatomically alike. The so-called diagnosis will depend chiefly on the localization, the extension and the intensity of a uniform type of process.

Mackenzie, J. THE THEORY OF DISTURBED REFLEXES IN THE PRODUCTION OF SYMPTOMS OF DISEASE. [B. M. J., Jan. 29, 1921.]

Sir James Mackenzie enunciates and develops the theory that the vast majority of the symptoms of disease are disturbances of normal reflexes. In many diseases all the symptoms on which a diagnosis is based are reflex in origin—in some the reflexes are disturbed by the entrance of the stimulus through the nervous system, and in others the disturbance is through the circulation. To the former belong the symptoms of such diseases as gastric ulcer, renal calculus, gall-stone disease. The symptoms in infections are due to the disturbance of the reflexes through the circulation, as influenza, malaria, typhoid and typhus fevers, measles, and abscess formation, apart from the swelling. In some diseases one gets a mixture of both kinds of reflexes, as in appendicitis, where there is not only the local pain and tenderness of the tissues of the external body wall, with contraction of the muscles of the abdomen, but the feeling of exhaustion, rapid pulse, tendency to vomit. In cholecystitis one gets a similar complex. The need for the more accurate recognition of symptoms is seen when it is considered how difficult it is to diagnose even such seemingly simple affections as gastric ulcer and appendicitis.

Though surgeons have been operating for these complaints for many years, the most experienced recognize that in many cases they find they have been mistaken in their diagnosis. This is due in a great measure to the fact that the nature and mechanism of the symptoms of these diseases have never been understood, and the symptoms were never clearly differentiated from those of other diseases which they resemble. It will thus be seen that symptomatology is like chemistry, where the combination of elements results in the production of a great number of compounds bewildering in their variety. Nevertheless, as in chemistry, when they are subjected to strict analysis they can be resolved into their component elements. When the analysis of symptoms is studied as fully as the analysis of chemical compounds has been studied, then it will be possible to group the disturbed reflexes in an orderly manner. The next step then will be to find out the agents capable of provoking the different reflexes, so that we get nearer to the immediate cause of disease. The employment of this method of investigation is but a return to those methods of clinical research which were so fruitful in their results in the past, especially during the early half of the nineteenth century. To realize how great the progress was during that period one must consider the discoveries associated with the names of Addison, Bright, Graves, Adams, Stokes, Cheyne, Paget, Hodgkin, and Jenner. These observers employed the most useful of all weapons in research—the trained senses. A certain number of symptoms are due to structural changes and functional derangements. These are generally shown by physical signs, and are due to departures from the normal in various ways, as in alteration in the size and shape and consistency of organs, changes in the color, as pallor, modifications of the sounds of the heart and lungs. The writer does not discuss these in the present contribution, but holds that they must be reconsidered in view of the theory which he propounds of disturbed reflexes, because many apparently structural and functional signs are really disturbed reflexes. He thus maintains the essential participation of the nervous functions in all disease.

Penfield, W. G. THE GOLGI APPARATUS AND ITS RELATIONSHIP TO HOLMGREN'S TROPHOSPONGIUM IN NERVE-CELLS. [*Anat. Record*, 1921, XXII, No. 57. Med. Sc.]

Investigations were carried out by means of Cajal's uranium nitrate method. For counter-staining he finds it particularly useful to immerse untuned sections in a dilute solution of polychrome methylene blue for one to four hours, this being followed by passage through alcohols of increasing strength and differentiation in absolute alcohol. By this method also Holmgren's trophospongium is sometimes stained. But for the study of the relationship between the latter and Golgi's apparatus Penfield prefers to make drawings of the apparatus from certain selected cells, subsequently removing the cover-slip and bringing the slides through

graded alcohols into 5 per cent iron alum for twelve to twenty-four hours. This removes all silver from the cells as well as the counter-stain, and at the same time mordants the tissues for further staining with iron-haematoxin. If the proper amount of differentiation has been secured of the particular cells already drawn, the trophospongium is found stained with great detail. The results obtained are summarized in the following conclusions: In neurones the apparatus reacts to axone section in a specific manner. There is no similar response on the part of Holmgren's trophospongium. The two structures may be demonstrated independently in the cytoplasm of the same neurone, either successively or simultaneously. Occasionally there appears a close anatomical relationship between parts of the apparatus and of the trophospongium, which may indicate an intimate association of function. Further work upon the Holmgren canals is required clearly to demonstrate the developmental stages and in fact their existence *ante mortem*. [DaFano.]

Ochterena. RELATIONS BETWEEN COMPARATIVE NEUROLOGY AND PSYCHOLOGY. [Revista Mexicana de Biología, Aug., 1921, I, No. 6.]

Without some fundamental touch with psychology in the making our pedagogics is founded on individual and collective prejudices and superstitions. The importance of comparative neurology for the understanding of human psychology and especially for training the young is here justly emphasized. The human cortex is only an elaboration of a brain common to all vertebrates. The primitive is present in every human being, and its voice is heard in the infant and it coöperates in every action throughout life. All education should utilize the instinctive curiosity of the animal brain, discipline it, and balance by other activities what can never be extirpated, namely, anger, fear and sexual impulses. The laws of the evolution of the universe are written into human structure, as they are into the structure of the lower animals, and what we term ethics, honesty, morality, etc., are but partial glimpses, imperfectly understood, of these fundamental laws which, followed, permit evolution to emerge into better forms.

Camus, J. NEUROLOGY IN 1920-1921. [Paris Médical, Oct. 2, 1920; Oct., 1921, XL.]

In this annual review Camus takes up a number of issues which both war and post-war neurology have rendered important. In reference to the diagnosis of syphilis, made more vital by reason of the many war-time infections, Camus says that lumbar puncture fluid should always be examined the fourth year after infection with syphilis. If the patient is not seen until between the fourth and tenth years, the fluid then should be examined regularly. After the tenth year it is relatively less important, as in 75 per cent of the cases the symptoms by that time are unmistakable. He brings out, what some American neurologists have

been teaching, that so-called pituitary symptoms are more due to the organizing (vegetative) action of the pituitary than the secretion. As Jelliffe and White have pointed out hormones are servants of the nervous system. They are simply stimulants of certain reflex arcs, just as truly as is CO_2 , or any other environmental material. Stocker's hyperthyroid maniacal excitement relieved by thyroidectomy is a commonplace of modern psychiatry. To assume all maniacal excitements are of thyroid origin is absurd. In his 1921 report, Camus calls attention to the encephalitis epidemics which have focused the attention of neurologists the last year, and, next to this, the vegetative nervous system has claimed extensive attention. The study of the vegetative nervous system has been taken up by physicians of all countries and from new points of view. A few facts have thus been established and a number of theories advanced which lack confirmation as yet. The instructive oculocardiac and pilomotor reflexes and the affinity of certain parts and of these only to certain chemical substances, endogenous or exogenous, are facts of the highest importance. The important influence of emotions on the vegetative nervous system, which Jelliffe and White maintain acts both acutely (conscious) and chronically (unconscious) are just as definite as any other influence, physical or chemical. In examining candidates for aviation he found that the most instructive data were those obtained from the intensity, duration, etc., of the vasomotor, cardiac and respiratory reactions to induced emotions, an experience which has been confirmed many times in other countries. It is impossible to conceive they say how a secretion could induce the extra deposit of fat at some points and its disappearance at other points, such as is seen in lipodystrophy, while a neurogenic reflex arc activity would readily explain this. The peptone antianaphylaxis treatment of migraine and the antianaphylaxis treatment of epilepsy by seeking the article of food that seems to bring on the seizure and having the patient eat half a gram of it forty-five minutes before the regular meal of the same, open new horizons in treatment. The benefit from luminal treatment in epilepsy, and from arsenical preparations in Parkinsonian syndromes from direct injection of alcohol in causalgia, and from epinephrin by the mouth in Erb's myasthenia.

Jonkhoff, D. J. THE NECK REFLEX IN PROGNOSIS. [Neder. Tijdschrift v. Geneeskunde, Jan. 24, 1920, I, No. 4.]

This is a clinical history of a case of status epilepticus. The patient's head was twisted to the right and when it was passively turned around to the left, the right arm, which was in extreme extension, became flexed. The left arm, which had been flexed, straightened out. This associated neck reflex could be elicited during coma only. There was also at times a mild reflex in the legs and in the eyes upon turning the head. After nine days of coma the patient died and autopsy showed extensive hemorrhage in the central convolutions and right ventricle. These neck reflexes.

have been described by Magnus and Kleijn and others, and eight cases have been reported in which they were found in hydrocephalus, meningitis, idiocy, or apoplexy.

Bury, J. S. EARLY SYMPTOMS OF NERVOUS DISEASE. [Lancet, London, Sept., 1921, II, No. 11.]

In this general review the author discusses pain, numbness, motor disability and the plantar reflex in their bearing on an early diagnosis of nervous diseases. Subjective symptoms are too lightly thought of as "imaginings" and not enough considered in the analysis of cases.

Mills, C. K. DENTAL INFECTION IN NEUROPSYCHIATRY. [N. Y. Med. Jour., April 10, 1920.]

This author gives a careful résumé of his experiences with dental infections. A score or two of cases, he says, have passed through his hands or have come to his knowledge in which important nervous and mental diseases have been attributed to dental infection. With the co-operation of physicians, roentgenologists and dentists, the necessary teeth have been removed with results not only unsatisfactory but often so harmful as to impress Mills with the futility, if not the criminality of the procedure. Some of the diseases which came under his observation in connection with the question of dental infection are dementia praecox, manic depressive psychoses, epilepsy, neurasthenia, hysteria and psychasthenia. The teeth in these cases were pulled out without a single result of any value.

Krambach, R. DISTURBANCE OF DEEP SENSIBILITY IN PERIPHERAL INJURIES. [Zschr. f. d. ges. Neur., Vol. LIX, p. 272.]

The different degrees in which motor ability and superficial and deep sensibility were affected in two cases reported lead the writer to certain conclusions regarding the relative position of the fibers involved. The two cases suffered lesion of the motor and sensory roots of the lower cervical segments. In the first case both deep and superficial sensibility were seriously disturbed, the latter in all its forms. The vibratory sense was affected less than the superficial sensibility, but more than the joint sense. In the second case the disturbance of deep sensibility far exceeded that of the superficial sensibility as did that of the vibratory sense. Both cases showed distinct involuntary athetoid movements. So the writer concludes that the fibers of superficial sensibility lie together in the peripheral nerves and not mixed with the motor fibers. Those of deep sensibility on the contrary join the motor fibers peripherally to go with them to the muscles and through the tendons to the joints. In cross section of the extravertebral roots and plexus trunks the fibers of superficial and those of deep sensibility lie separate and the uniting of the joint fibers with the motor evidently takes place distally to the point of lesion.

Albanese, A. MODIFICATIONS IN TRANSPLANTED NERVES. [Arch. ital. di chir., 1921, IV, No. 215. Med. Sc.]

An experimental inquiry on the fate of nerve fragments transplanted into muscle, and on the differences in tissue-reaction in the host induced by homo-, auto-, and hetero-transplants. The animals used were rabbits and dogs. The nerves were implanted, with all precautions and great delicacy, into the glutei; there was no attempt to bring the grafts into relation with nerve cords. In the case of hetero-transplants the lipoids of the medullary sheath are slowly transformed into neutral fats; there is a rapid oedematous swelling of the axis cylinders, which persist nevertheless, though of necrotic aspect. The nuclei of the sheath of Schwann disappear though an ill-staining filamentous mass remains. The tissues of the host betray but feeble proliferation, with little tendency to invade the transplanted fragment. Homo- and auto-transplants alike show an intense transformation of lipoids to neutral fats which undergo rapid absorption. The axis cylinders quickly disappear. The sheath of Schwann preserves its appearance as an organized tissue even after forty days, and the nuclei survive. At the same time there is a rich proliferation of the connective tissue of the host, with swift invasion and organization of the graft.

Macaggi, G. B. BIFURCATION OF THE POSTERIOR TIBIAL NERVE. [Arch. ital. di Chir., 1921, III, No. 507-16. Med. Sc.]

Normally the nerve divides 1.5 cm. above the tip of the malleolus, whilst the artery of the same nerve divides three cm. lower, or on the level of the sustentaculum, after it has crossed the internal plantar nerve. The arterial division is very constant in level, but the nerve in 13.5 per cent of cases divides much higher than usual and by as much sometimes as 8.5 cm. To expose the nerve it is advisable to use, not the semilunar incision customary for the artery, but a vertical one above it.

Burke, N. H. M. ELECTRICAL STIMULATION OF NERVES AT OPERATION. [Lancet, April 3, 1920.]

Conductivity to electrical currents is conclusive evidence of physiologic continuity of nerve fibers, as also is excitability below the lesion. Improvement in conductivity or in peripheral excitability, this surgeon says, following immediately after neurolysis is suggestive of only slight compression and possibly chemical nerve-block. Absence of conductivity and of excitability, even after neurolysis, is not conclusive evidence of division, but is an indication of severe nerve disturbance, although not insuperable.

Sargent, Percy. LESIONS OF THE BRACHIAL PLEXUS ASSOCIATED WITH RUDIMENTARY RIBS. [Brain, July, 1921. Aust. M. J.]

Variations in the composition of the brachial plexus according to Sargent are apt to be associated with costal abnormalities, prefxation, *i.e.*, failure of the first dorsal contribution, with a seventh cervical rib,

and postfixation, *i.e.*, a large contribution from the second dorsal root, with an abnormal first thoracic rib. Of the different cervical ribs met with clinically, that which most frequently calls for operation, is an abnormally large nonjointed costal process, continued onwards as a dense fibrous band, to be attached to the first thoracic rib behind the *sulcus nervi brachialis* (*sulcus subclaviæ*). Symptoms gradually arise from continual slight traumatism to the eighth cervical root or lowest cord of the plexus, caused by the tightening of the band during respiration and in certain movements of the arm. With a postfixed plexus, symptoms referable to the first thoracic root may be caused by the pressure of a normal first thoracic rib. "Vascular symptoms" are vasomotor in origin and result from injury to sympathetic fibers. The results of operative treatment in fifty cases are given, the majority having been traced for a period of from two to twelve years. Pain was cured in nineteen cases and relieved in eight. Muscular wasting was cured in twelve cases, relieved in twelve and unrelieved in seven. Vasomotor symptoms were cured in fourteen cases, relieved in six and unrelieved in two.

Brüning, F. TROPHIC ULCERS FOLLOWING DIVISION OF NERVES. [Zeit. für Chir., Nov. 27, 1920. J. A. M. A.]

Brüning asks, How is the curative effect of nerve suture on torpid ulcers to be explained? Leriche regards disturbance in the sympathetic innervation as the cause of trophic ulcers following nerve injuries; such ulcers healed after periarterial sympathectomy, removal of the neuroma and restoration of the continuity of the nerve. On the basis of two successful cases Brüning thinks that not the sympathectomy, as performed by Leriche, was the essential factor for the radical cure of the old trophic ulcers, but rather the resection of the neuroma and scar tissue, and the restoration of nerve continuity.

Worster-Drought, C. CONDENSER TESTS IN DIAGNOSIS AND PROGNOSIS OF NERVE INJURIES. [Brit. Med. Journ., Sept. 11, 1920.]

These observations are based upon experiences with some 2000 cases of injury to nerves of the upper and lower limbs seen while the author was acting as neurologist to the Woolwich Military District from 1916 to 1919. It is pointed out that the faradic coil is not an accurate instrument for testing muscle reactions, since the factors upon which the response depends—voltage, duration of each electrical impulse, rate at which the impulse is delivered—are variable; further, the majority of cases of nerve injury fail to show any response to the faradic coils in clinical use. Galvanism, as ordinarily used for testing, is similarly inaccurate, for voltage, milliampère readings, resistance, etc., require standardizing. In the condenser set the voltage is fixed and the duration of each impulse known; provided that the same precautions are invariably taken to minimize skin resistance and pads of the same size always used.

we have a fairly accurate means of testing muscle reactions. The condenser used was the modification of the Lewis Jones set suggested by Purves Stewart. The condensers are charged from a direct current, and by means of a rheostat, can be fixed at 100 volts. The scale consists of twelve stops varying in capacity from 0.016 to 4.0 microfarads; for convenience, a muscle is spoken of as reacting on, for example, No. 6 stop, meaning a contraction occurs with a capacity of 0.10 microfarads at 100 volts. Before testing, the limb is immersed in warm water for five minutes and two woodenhandled electrodes, fitted with circular pads one inch in diameter are used in the test, one being placed on the motor point and the other elsewhere on the muscle. Working from above downwards, the various capacities are tried until the lowest stop on which the muscle shows any appreciable reaction is reached. Thus, when it is stated that a certain muscle reacts on No. 8 stop, we mean that the muscle will not react on any stop lower than No. 8.

As all normal muscles do not react on No. 1 stop (0.016 mf. at 100 volts), extensive observations were necessary to determine the normal standards; these are detailed. In general, it may be said that the larger and more superficially situated muscles of the arm react on No. 1 stop, the deeper muscles of the forearm react on No. 2, while the intrinsic muscles of the hand react on No. 3. No definite conclusions can be drawn from condenser tests made within one month of injury.

With regard to injuries to mixed nerves, although motor paralysis and complete sensory loss in the area of cutaneous supply may be found at an examination made more than a month after injury, the nerve may still recover its function apart from operation. It is in these cases that condenser tests are of great value. If in lesions of the musculospiral, median, anterior crural, sciatic, external or internal popliteal nerves, the majority of the muscles react on No. 7 stop (0.25 mf.), or below, an incomplete lesion may be diagnosed and recovery expected without operation. The same may be said of an ulnar nerve lesion in which the intrinsic muscles of the hand react on or below No. 8 stop.

If no response is obtained below No. 8 in muscles normally reacting on Nos. 1 or 2 stops, the case should be treated on the usual lines and re-examined after an interval of six weeks. If no improvement is then found in the condenser reactions, operation should be advised. At operation the nerve is usually seen to be compressed by scar tissue or partially divided. If actual retrogression is found after the six weeks interval, exploration should be advised without hesitation. If the muscles supplied by the injured nerve fail to react on any stop below No. 10, the majority reacting on Nos. 10 to 12, the nerve is suffering from severe compression, partial anatomical division, or in some cases, complete division, and is most unlikely to recover apart from operation.

The author has met with comparatively few cases, examined at a period exceeding two months from the date of injury and in which

subsequent operation has revealed complete division of the nerve, to show a response on any stop below No. 12 in any muscle supplied by the injured nerve. In the case of lower limb muscles, no response can usually be obtained even on No. 12 when the nerve is completely divided. When all muscles supplied by the injured nerve fail to react on the highest stop, therefore, complete division, either physiological or anatomical, is usually present. If not anatomically divided, the nerve is found to be so intimately involved in scar tissue as to render resection and end-to-end suture necessary.

As in severe injuries involving the lower limb nerves, the muscles often fail to react even on the highest capacity (No. 12) at 100 volts, it has been suggested that it would be desirable to use a higher voltage than 100 for testing leg muscles. Although indicated for the more accurate estimation of reactions, for practical purposes the author's experience has been that if the muscles fail to react on No. 12 at 100 volts, operation will certainly be required. Whenever he has seen such a case, operation has invariably been advised and in all cases revealed a severe injury which apparently could only recover as the result of surgical intervention.

A practical difficulty sometimes arises when muscles are much atrophied; on No. 8 or No. 9 stop being reached, the condenser discharge produces marked contraction in muscles in the neighborhood of those in which stimulation is being attempted. Although unsatisfactory from the point of view of exact testing, the practical disadvantage of the occurrence is not as great as might appear, for it may be safely assumed that the severity of the nerve lesion is such as to require operation. In all cases met with, the operation advised was never found to be unnecessary. With regard to injuries to mixed nerves with only partial cutaneous sensory loss, the muscles innervated by the affected nerve seldom fail to react on or below No. 10 stop. If reacting on No. 8 or below, recovery almost invariably ensues without operation. Cases in which the majority of muscles react on No. 10 should be examined every four weeks; if no improvement be apparent after the third examination, exploration should be advised. Some cases appear to remain stationary; in such instances operation usually reveals moderate involvement in scar tissue or a partial division of the nerve, and surgical treatment is followed by rapid improvement.

As regeneration proceeds, there is usually a progressive diminution in the capacity of the condensers required to evoke a contraction in the muscles supplied by the damaged nerve. When the condenser reactions improve progressively month by month, it may be safely assumed that recovery is taking place in spite of the continued absence of voluntary movement. When the reactions approach No. 8 stop from above, voluntary movement may be expected shortly to appear. If, after operation, no change in the condenser reactions takes place month after month, it

is probable that the operation has been unsuccessful and that no recovery will occur.

It is not suggested that one should rely solely on quantitative condenser reactions; there are other important factors which often have to be considered, such as the condition of the paralyzed muscles, the absence or otherwise of systematic treatment, sensory changes, etc. The purpose of the foregoing communication is to illustrate the value of condenser tests in assisting one to arrive at an opinion as to the extent of a nerve lesion, the nature of the treatment to be recommended, and the ultimate prognosis. [Author's abstract.]

Robertson, W. NERVE SUTURE. [Lancet, November 13, 1920.]

In this somewhat anomalous case the median nerve was severed in a clumsy attempt to set a humerus fracture. After union there was atrophy of the forearm and hand. On freeing the nerve from cicatricial tissue the sheath was found to be intact, but a gap measuring 2 or 3 mm. in the continuity of the nerve itself was found. The sheath was cut through and the two cut ends of the nerve examined. Each surface was found covered with small repair tuberosities. No tissue existed between the ends. The two ends freed from elaborated material were sutured through with fine silk, the proper alignment observed and the nerve sheath carefully stitched. Shortly after the operation the patient could feel his fingers. He could also discern articles placed between fingers and thumb. The early functioning of the nerve paths is attributed to the fact that the nerve sheath had not been injured.

Putti, V. RECURRING RADIAL PARALYSIS. [Chir. degli Organi di Movimenta, Feb., 1920, IV, No. 1. J. A. M. A.]

The girl was healthy until, at thirteen, right radial paralysis developed, without pain. It subsided under the usual measures in three months, but bluish patches were noticed on the arm afterward for some time. A year later the paralysis returned as also the purpura in the radial territory. No relief was obtained by any measures, and after three months there was intense pain in the upper arm. A large bluish patch ulcerated, and the disturbances kept up until the radial trunk was exposed and adhesions separated, physiologic saline injected around the nerve, and the nerve wrapped in a segment of artery from a dog. A few months later the paralysis returned, and it has persisted for three years to date. Bacteriologic examination of the blood the second year disclosed a pathogenic hemorrhagic pseudodiphtheria bacillus. This may have been responsible for the apoplectiform neuritis. Reëxamination ten months later was negative, and the serum showed no agglutinating power for this bacillus, but guinea pigs inoculated with it developed hemorrhages in the skin, and in one animal, in the sheath of a nerve. In the course of six years the girl has thus had four attacks of right and three of left radial paralysis, and at present the radial paralysis is bilateral.

Riquier, G. C. FASCICULAR SYSTEMATIZATION OF PERIPHERAL NERVES. [Boll. d. Soc. Med. chir. di Pavia., 1920. Med. Sc.]

Investigations were made in order to control the result obtained by Dustin, who found that in the median, radial, and ulnar nerves of man, the nerve fasciculi divide and anastomose within the nerve-trunk so as to form a large and complicated plexus which makes a functional systematization on an anatomical basis impossible. But Riquier, having made serial sections of pieces of human cubital nerve, even as long as four centimeters, came to the conclusion that the fasciculi change in number and size according to the level at which the sections are made, but have fundamentally the same position along the nerve-trunk; some fasciculi even maintain a constant situation in the whole series. The author therefore thinks that an irregular mixing of nerve-bundles and fasciculi within the same nerve-trunk ought to be excluded. This, however, has little value from a functional point of view because the fasciculi, though maintaining a certain individuality along the nerve, may contain both sensory and motor nerve-fibers. The question can be resolved only by having recourse to experimental sections of spinal roots in high vertebrates, but particularly in monkeys. [DaFano.]

McConnell, A. APPROACH TO MEDIAN NERVE IN FOREARM. [Dublin Jour. of Medical Science, April, 1920.]

The simplest method of reaching the plane between the superficial and deep muscular groups, where this nerve lies, according to McConnell, is to make an incision along the free border of the flexor carpi ulnaris muscle. On retracting this muscle, the interval between the flexor sublimis and flexor profundus muscles is immediately exposed. The ulnar artery and nerve are seen lying on the flexor profundus. A retractor is then inserted deep to the flexor sublimis, and the muscle is drawn anteriorly and laterally, thus exposing the median nerve in the greater part of its course in the forearm. With full flexion of the wrist the nerve lies easily accessible down to the transverse carpal ligament. [J. A. M. A.]

Christin, E., and Naville, F. CENTRAL NEUROFIBROMATOSIS. [Annales de Médecine, July, 1920.]

This clinical record is of a man of thirty-nine years of age in whom thirty-one tumors were found within the skull. They were histologically of the most various structure, glioma, fibroma, neuroma, myxoma, osteoma, endothelioma and sarcoma. In the anamnesis it was found that at seventeen the patient had become deaf after sudden vertigo and a fall, but to the age of thirty-nine no other symptoms had developed. Of the twenty-three cases of central neurofibromatosis on record in sixteen the first symptoms had appeared before the age of twenty, but then intervals up to thirty-five years had passed without further disturbances. Neuro-

fibroma of the optic nerve in childhood is known for twenty-three cases. Central complete deafness is very characteristic. It was bilateral in sixteen of the twenty-three cases and unilateral in four; in the others, an otitis might have explained the deafness. In only one of the total was the hearing normal. Equilibration was scarcely impaired, although the labyrinth was evidently destroyed. There were cutaneous neurofibroma only in about two-thirds of the cases, but a familial or hereditary character was evident in several.

Neri, V. CLINICAL IMPORTANCE OF ELECTRICAL EXAMINATION OF CUTANEOUS SENSIBILITY. [Rev. neurol., 1920, i, 19; J. de radiol. et d'électrol., 1921, V, No. 45. Med. Sc.]

As a means of examining the cutaneous sensibility, electrical stimulation is better than all others because it can be more easily and more accurately applied and measured; thanks to it, alterations which because of their smallness would be liable to be unobserved can be ascertained, and the progression or retrogression of an ascertained alteration in sensation can be accurately followed. Electrical examination of the cutaneous sensibility should be made both with the faradic and galvanic stimuli.

I. Electrical examination of the sensory organs. The examination is made by the unipolar method: the large indifferent electrode on the back, the active electrode on the particular cutaneous surface. In the faradic current, the best active electrode is Erb's, made of a bundle of more than four hundred fine metallic wires. Painful sensations should not be obtained. In cases of unilateral disorders the value of the research lies entirely in the comparison of the sound with the injured side. The zones of alteration of painful sensation to faradism (hyperaesthesia, anaesthesia, hypaesthesia) are usually more extensive than the zones of alteration brought to light by the other stimuli (Carati). This same author has found a difference between the faradic stimulus and the other cutaneous and painful stimuli: faradic hypaesthesia in the zones of tactile hyperaesthesia and pain.

The author has proved in tabes a noticeable degree of farado-cutaneous hypaesthesia associated with a very pronounced galvanic hyperaesthesia; this difference had already been observed, and demonstrates the necessity of following the research on the faradic sensibility by that on the galvanic sensibility.

With an equal current, it is the rule that the painful sensation is more pronounced at the closing of the cathode than at the opening of the anode. It is possible to have equality of polar sensation or inversion of polar sensation.

II. Electrical examination of the sensory nerves. It is of the greatest importance. Unipolar method: indifferent electrode on the back, active electrode on the sensory nerve. The author, instead of placing the stimulus on the mixed nerves, stimulates the cutaneous nerves at their

point of emergence from the aponeuroses. In analogy with the motor points, he calls these points of election "sensory points". At the time of the examination it is as well to have before one plates on which the points of emergence of the principal sensory nerves are marked in black [Plates are given by the author.]

With the faradic current, each induction shock produces a short pricking sensation which, when the current is making and breaking quickly, becomes continuous, stinging, and throughout the nerve a distal sensation, at first of tingling, later of pricking. The intensity of this faradic sensation increases with the rapidity of the interruptions. With the galvanic current, in addition to the distal sensation of pricking, is observed a keen sensation of burning of the skin, limited to the surface of contact of the electrode.

As is seen with the motor nerve, the cathode produces in the sensory nerve a reaction on closure and the anode on opening: the special quality of the cathode is much more intense. This is what Erb has called "the law of the sensory shock".

Normally the sensations developed by the electric current are manifested as much at the cutaneous surface immediately covered by the electrode as in the zone of distribution of the cutaneous nerve. In lesions of the nerve-trunk, even slight, one observes a limitation at the surface of contact of the electrode and an abolition of the radiation of the sensation in the sensory area of the nerve.

III. Comparative examination between the electrical sensibility of the nerve-terminations and the conductivity of the electric wave across the sensory nerve. In lesions of the nerve-trunks comparison of the fibers and the nerve-terminations can give the most dissimilar results. In slight lesions the following is most often seen: inexcitability of the afferent paths, hypoexcitability and occasionally hyperexcitability of the sensory terminations. Neri quotes some examples: A soldier complained of pain along the ulnar side of the left forearm and the two median digits. All the signs were negative, one only was positive: the inexcitability of the cutaneous branch of the ulnar nerve at the ulnar side of the wrist to which was added faradic and galvanic hypaesthesia of the two median digits. Such a finding justified the diagnosis of inflammation of the afferent roots of the eighth cervical and first dorsal nerves. Another example is one of sciatica, in which electrical examination of the sensibility gave exact proof and removed all doubts. The cutaneous sensory organs can react towards the electric current in an absolutely different manner to the afferent fibers.

In severe lesions hypoexcitability of the afferent paths and inexcitability of the sensory organs are noted. The inexcitability of the afferent paths and of the sensory organs indicates a syndrome of complete interruption which, ascertained long after the trauma, proves an irreparable lesion. In central lesions a parallelism between the results of the exami-

nation of the afferent paths and the sensory organs is always ascertained. One sees the medico-legal importance of electrical examination of the cutaneous sensibility which ought to take a great place in the semiology of the nervous system.

Delherm et Laquerrière. ELECTORADIOLOGY IN NEURITIS OF MOTOR NERVES. [J. de radiol. et d'électrol., 1921, V, 97. Med. Sc.]

The authors show first of all that the contraction on electrical stimulation does not form the sole treatment in neuritis of a motor nerve, and secondly, put forward the excitomotor method for each particular case and the manner of applying it.

I. Applications without excitomotor action. A. *Applications acting on tissues irritating or compressing the nerve.* (a) Radiotherapy often acts quickly and well; particularly in deep lesions, following pachymeningitis, contusion of the vertebrae, etc. It is equally useful in superficial cicatricial lesions. (b) In superficial scleroses and adherent cicatrices the constant current is the best form of treatment: the negative pole is placed over the spot where the nerve is caught up. If the cicatricial tissue has a greater resistance than surrounding tissue, most of the current passes through the latter. Sodium chloride and potassium iodide on the negative pole are the best salts to use.

B. *Applications acting on the nutrition, circulation, and trophic mechanism of the part affected.* The part as a whole and not only the injured muscle must be treated. (i) Coldness, circulatory disturbances, etc.: In preference to other methods stated, the authors use their thermoluminous couple: an equally good procedure is friction with Oudin's electrode. In marked cases of coldness thermopenetration can be used. (ii) Applications designed to act upon the trophic mechanism: If there be a total or partial R. D. the trophic action of the constant current alone must be used: if painful or spasmodic phenomena are present, muscular contraction should not be induced. The constant current can be applied in two ways: (a) Classical technique: the current is made to pass along the affected part; the authors recommend electrodes made of wet packs in preference to bath electrodes. The intensity varies according to the age of the patient, his build, the condition of the skin, etc.; the duration of the application is from 10–20 minutes. (b) Technique of Hirtz: the electrodes of wet packs, 3–4 cm. thick, are in the shape of long, broad bands; they are placed one on each side of the affected part. The intensity can be as high as 200–300 milliamps, and the duration 45–60 minutes.

II. Applications producing an excitomotor action on the muscles. When there is neither pain nor spasm, trophic applications should be associated with those designed to act on the muscle by making it contract. Muscles showing an R. D.: In severe lesions, trophic applications alone should be made at first, but later a few muscular contractions should be caused without fatigue. Sharp shocks from the constant current are

generally used, but these make the neighboring muscles contract or only cause a small amount of work on the part of the muscles which are really affected; also the amount of work done by the injured muscle cannot be gauged as is necessary. The authors, therefore, have recourse to the galvanogalvanization described by Babinski, Delherm, and Jarkowski. When the muscles are less injured the best excitant is an undulating galvanic current. When the muscles show a clear contraction and one not delayed, good exercise is obtained by the interrupted constant current.

When the state of degeneration in the various muscles is practically the same the whole limb can be acted upon: the electrodes for trophic applications are left in place, but a metronome is placed in the circuit. When, on the other hand, the muscles or groups of muscles are unequally affected, every muscle must work, and work at the degree which suits it. Four methods of bringing this about are given.

III. Applications having an excitomotor action on nondegenerated muscles. When a muscle only shows hyperexcitability it should be treated by the faradic current or one of that kind, but a tetanizing current must never be used. The induction shock is the simplest, but according to the authors, not the best, as it causes a brisk contraction. The tetanizing faradic current interrupted by the metronome causes a definite but short contraction; this is used in most cases. The undulating tetanizing faradic current causes effects closely allied to voluntary contraction. Electromechanotherapy with resistance consists in sending into a muscle an undulating current, while a resistance opposes the contraction: it is of great use in many cases.

IV. Superadded neuropathic conditions. Neuropathic conditions more or less severe and leading to impotence may develop in the course of any affection of long duration. The authors discuss these and their treatment.

V. General guidance for treatment and conclusions. The electrotherapeutics of motor-nerve neuritis are far from being of one kind: different procedures suit different cases. (1) In every case where possible (neuritis due to compression) the cause itself must be acted upon. (2) It is most useful to act upon the circulation of the injured part by different methods, of which the authors prefer light baths, thermopenetration, and high-frequency friction. (3) It is essential to stimulate the nutrition of the affected parts by the constant current; this appears to the authors to be the basis of treatment in all cases of motor-nerve neuritis. (4) Treatment by excitomotor action will be chosen after the electrical examination. (5) Excitomotor applications will be made such that each muscle will contract. (6) As the case progresses the time given to muscular contractions is increased and that of the constant current decreased until it is omitted entirely. (7) When there is no R. D. the circulation and local nutrition can be attended to, best of all, by way of faradism. (8) Faradism can be employed in various ways, the most satisfactory being an undulating tetanizing faradic current. (9) The possibility of superadded neuropathic conditions must not be forgotten.

Chartier. TREATMENT OF MEDULLARY AND RADICULAR AFTER-EFFECTS OF EPIDEMIC ENCEPHALOMYELITIS. [Bull. offic. Soc. franc. d'électrothérap. et de radiol., 1920, Nov., 180. (J. de radiol. et d'électrol., 1921, V, 142.) Méd. Sci.]

Epidemic encephalomyelitis (lethargic encephalitis) leaves encephalic after-effects, among which is a pseudoparkinsonian syndrome which may be noticeably improved by thermoluminous baths followed by warm hydrotherapy and by static baths. But the author insists especially on medullary or meningoradical after-effects; he has treated four cases and reports the most typical observation: a man of fifty taken with febrile malaise, considered at first to be rheumatism complicated by neurasthenia, headache, asthenia, stiffness of the neck, invincible diurnal sleepiness, nocturnal insomnia, difficulty of speech and of ocular accommodation. When the author saw him in June 1920 the encephalic phenomena were very few, but the medulloradical manifestations became progressively accentuated: stiffness of the whole spine, permanent contraction in flexion, clonic movements, exaggerated reflexes, muscular atrophy, very sharp pains in the left upper limb; pains, also sharp, but less marked, and contraction in the superior right limb; spasmodic paresis with exaggeration of the reflexes in the lower limbs, etc. The treatment consisted of general thermoluminous baths one day, localized on the spine, and followed by warm hydrotherapy the next day, and daily applications of high frequency on the spine and the painful plexus. First, development was arrested, and at the end of a fortnight an improvement which continued and increased. After five weeks treatment was continued by Dr. Menuet (Tours), who added cervicodorsal radiotherapy. Three months after the beginning of treatment, and five months after the beginning of the disease, the patient was cured. Now, in the numerous similar observations which have been published and in which mention is never made of physical treatment, development towards cure is much more slow. In another case, the continuous current used to combat the muscular atrophy brought back the pains; it is therefore necessary to take care, and particularly to see that the current does not traverse the plexus and the spinal cord (for example, give the applications from the hand to the shoulder and not from one hand to the other).

III. SYMBOLIC NEUROLOGY.

2. PSYCHOSES: DEFECT STATES, ETC.

Lehmann, Hans. PSYCHICALLY SOUND AND SLIGHTLY WEAKMINDED CHILDREN. [Ztsch. f. d. ges. Neurol. u. Psychiat., 1919, Vol. XLVII, p. 387.]

The object of the author was to compare the mental ability of children who were only slightly weakminded with that of wholly normal children. He requested definitions of words from a number of slightly feeble-minded children and from the same number of psychically sound children and

was able to establish a series of facts which permitted him to characterize the intellectual performances of these two groups. The weakminded showed in their definitions small command of language, this poverty of words being apparent in the failure to differentiate between the finer shades of meaning, so that the same word was used in several senses. Their construction was clumsy and their manner of expression primitive, due, partly, to lack of fluency in speech and, partly, to more profound mental defects. There was restricted formation of associations and lack of ability to concentrate. On the other hand, the author's view that there are many features of resemblance in the logical performances of the slightly feeble-minded and of normal individuals was confirmed in various ways, especially in the similarity of the quality of the ideas. This quality is the primary moment which decides the value of the definition and in this test the intellectual differences between the two classes was little apparent. Both classes used the same types of ideas for defining the social conceptions. In the definitions of the parts of the body there was less difference between the two classes than between different members of the normal class. From these circumstances certain conclusions may be drawn concerning the degree of reduction of mental capacity in the slightly weakminded, namely, that they are not wholly defective in respect to abstract conceptions, although they may make use of them to only a limited extent and in a little effective manner. There is no limitation of the intellect to a definite level of logical performances which cannot be overstepped. There is, therefore, a possibility that considerable improvement in the mental performances of slightly weakminded children might be attained by proper pedagogic and therapeutic treatment. [J.]

Tausk, V. ALCOHOLIC OCCUPATION DELIRIUM. [Internat. Zeitsc. f. aertz. Psychoanalyse, Vol. III, No. 4.]

The author here shows the advantages of the psychoanalytic approach to the study of occupation delirium. Clinical knowledge throws no light on the various forms of mental disturbance of toxic origin, because of the impossibility of correlating the chemical conditions in the central nervous system with specific mental manifestations. Psychoanalysis, however, recognizes in the alcoholic psychoses, as well as in other psychoses of toxic origin, elements which in other mental disturbances have been traced back to their connection with the early mental history of the person or to native tendencies in his disposition, and it seems very natural to study these psychoses from the point of view of their relation to these psychological conditions already known. Of the alcoholic psychoses there are two principal forms, namely, hallucinosis in all sense spheres and the characteristic occupation delirium. From a psychoanalytic point of view a lesion in the inhibitory apparatus furnishes an explanation of many features of toxic insanities. The conditions resulting from inhibitions of this nature are apparent even in ordinary alcoholic intoxications (*in vino veritas*). If as result of the lesion in the inhibitory apparatus affects are mobilized which, because a part of the higher functions

of personality remains intact, cannot or may not find their specific outlet, the affect, constantly endeavoring to make the leap into activity, is changed into anxiety. The activity of the hallucinatory mechanism is explicable as a regression in the line from idea to perception.

While all this does not explain the occupation delirium, an analogy therefor was discovered by the author in a form of dream with which he became acquainted, the occupation dream, the homosexual origin of which he was able to trace as well as its connection with impotency. The main characteristic of the occupation dream, however, is the anxiety which the dreamer has of not being able to finish his task. The person suffering from alcoholic delirium, on the contrary, shows the pottering euphoria of a man of trivial interests, and, in his delirium, goes about his work with the greatest good humor. Not until a case of abortive alcoholic delirium came to the author's attention was he able to trace the essential relationship between the dream and the delirium. This was the case of a young woman whose attention could be turned to the observation of herself in the very midst of her delirium. From her history it was learned that her life with her husband was unhappy and that as result she had become addicted to alcohol. In her delirium the patient imagined herself engaged in piling laundry in heaps. From time to time she would push the heaps back and at this moment she became visibly agitated and hurried. Of this part of the delirium the patient said that she saw great heaps of laundry before her which, it seemed, she herself had ironed and must pile up. At first the work went on very well but for some reason the laundry never grew less, hence her anxious helplessness before the resistance of the laundry piles.

Very generally it is found that in alcoholics the delirium of occupation takes place in the following manner: the patient begins his task in good humor but soon the work takes the form of an interminable task or of one beyond the patient's strength. Before the delirium reaches the degree of anxiety which in the dream awakens the dreamer, the occupation, in the delirium changes, or the patient begins his work over again. Thus the author finds justification for the view that occupation dreams and occupation deliria, not only in alcoholics, but of every origin, have the same mechanism.

The following facts are evident: Analysis of the dreams shows that they arise from the fear of impotence. The latent thought which in the dream gave rise to changes of occupation corresponds to the resistance which in waking hours prevents the dreamer from enjoying sexual intercourse. Further, dreams of this character seem a direct reaction to the lack of sexual satisfaction—phenomena of abstinence.

Attention to the psychic details of the sexual life of both alcoholic patients and those subject to occupation dreams reveal a homosexual fixation of the libido. Analysis of the temptations which lead otherwise very well conducted persons to the abuse of alcohol shows that drinking may sometimes be due to disturbances of heterosexual relations arising

from external conditions, as, for example, disappointment in the wife, loss of a sweetheart, loss of sexual power in the wife, physiological impotence with increasing age, etc.

Evidence of the homosexual origin of addiction to alcohol is the fact that it is nearly always partaken of in the company of companions of the same sex. Men are the only guests at the drinking resort sought by the husband; the wife drinks with her female neighbors. Further evidence is the fact that alcoholic hallucinosis and delirium tremens may terminate in paranoia, the latter being of known homosexual origin. The guest table at the drinking resort constitutes a form of sublimation, the paranoia is the pathological symptomatic elaboration—both from the same disturbance. An important observation for the understanding of this problem is that patients suffering from alcoholic psychoses never masturbate, a practice frequent in other psychoses, from which it may be inferred that the alcoholic patients do not regress to the autoerotic level; the libido, so far as it is set into activity, remains an object libido. Briefly, the way to concrete homosexuality is barred for the alcoholic and he does not revert to autoeroticism. The occupation delirium of these patients, whose libido is increased by the resistances, can be nothing other than a coitus wish delirium which, in analogy with the occupation dream, takes the form of impotence anxiety. [J.]

Freud, S. PARANOIA AND THE PSYCHOANALYTIC THEORY. [Intern. Zeits. f. Psychoanalyse, Vol. III, No. 6.]

Peculiar persecutory delusions of paranoid type in a young woman client having aroused the suspicions of a lawyer to whom she applied for protection, the lawyer referred the case to Freud for the latter's opinion concerning the sanity of the young woman. The case proved to be of more than diagnostic interest; it seemed to contradict the fundamental theories of psychoanalysis concerning the genesis of paranoia, in such definite manner, indeed, that the author at first hesitated to make the diagnosis of insanity and was inclined to believe that the young woman might be the victim of a real persecutor. It is maintained in psychoanalytic literature that the paranoiac is engaged in a conflict against homosexuality based on a foundation of narcissism, and that the person regarded by the patient as persecutor is the one who has been the loved object. Combining these two principles it is apparent that the persecutor must be of the same sex as the person persecuted. Under these circumstances, however, causal significance could only be attributed to homosexuality if it were found to be at the foundation of all cases of paranoia without exception. Cases have been described where the patients believed themselves persecuted by persons of the opposite sex, but a glance beneath the surface reveals the true persecutor, stripped of disguises, to be of the same sex. Neither the author nor any of his friends had ever encountered difficulty in establishing the relationship of paranoia to homosexuality. In the author's present case, however, the girl seemed simply to have

rejected the love of a man and then to have ascribed to him the rôle of persecutor. The man with whom marriage was impossible from economic reasons had persuaded the young woman to visit him at his rooms where she permitted him to make tender advances. Immediately after the visit she developed the idea that he had arranged to have photographs to be taken of her while in a compromising situation and she interpreted sounds during the visit—ticking and knocking—as the clicking of a photographic apparatus. Two men whom she met on leaving the rendezvous she mistook for photographers. For a long time the author could find no trace of a female influence in the situation nor of a conflict against a homosexual attachment. Under these conditions the simplest way would have been to renounce the principle of the universality of the dependence of persecutory insanity upon homosexuality and face the consequences of such a renunciation. Mindful, however, of the grave mistakes that are often made because of the lack of thoroughness in the study of the conditions, he persisted in the analysis with the result of finally discovering the significant fact. The young woman claimed that the man was using the photographs to destroy her reputation and no assurances on his part could disabuse her mind of this obsession. The person to whom the persecutor showed the pictures, she claimed, was an elderly man “with white hair, like her mother’s,” the forewoman of the office in which the young woman was employed, who conveyed her disapproval of the young woman’s conduct by various secret signs of contempt. The forewoman of the office thus turned out to be a surrogate for the mother to whom the young woman had been devoted all her life to the exclusion of all other attachments and for whom she had sacrificed companionship of the opposite sex. The original persecutor thus stands revealed and in this case as in others is of the same sex as the paranoiac. The love for the mother is at the bottom of the whole conflict, preventing the first step toward a normal sexual relationship. In the insane idea about the photographers the author sees a variation of the incident of spying on the parents in sexual intercourse which is rarely absent in the history of neurotics, and this idea furnishes the means of orientation in the analysis. The patient identifies herself with the mother, the man whom she was visiting is the father and the spying must therefore be attributed to a third person. She has freed herself from her homosexual attachment to the mother by a regression—by taking herself as the love-object. That this regression is possible is further evidence of the narcissistic foundation upon which homosexuality rests.

The progress from an object of one sex to that of another is unusual, yet there are other formations beside paranoia presenting the same phenomenon. For example in neurasthenics where the sexual attachment is an incestuous one to mother or sister and where the sexual activity is limited to fantasy, a nonincestuous substitute is taken in fantasy because in this form the object becomes acceptable to the censor and is permitted to become conscious. There is, however, always a tendency on the part

of the libido, in such cases, to return to previous positions. This tendency Freud calls "fixation" and sees in it a factor resembling that which Jung has designated "psychic inertia." [J.]

Tausk, V. THE "MACHINE" IN DEMENTIA PRECOX. [Int. Zeits. f. a. Psychoanalyse, 1919, V, No. 1.]

In psychoanalytic literature this phase of schizophrenia has been treated only in a general way. The author therefore undertakes a thorough discussion of the subject. He brings forward only a single case, but one in which the "apparatus" presents signal peculiarities of construction, permitting illuminating inference. The influence which the apparatus in schizophrenia exercises upon patients is of various kinds; they may throw pictures like those of a magic lantern or cinematograph, these pictures being at times three dimensional, like the usual hallucinations; they may put thoughts into the mind, or prevent thinking; may cause motor or other somatic reactions; such as erections, pollutions (ascribed at times to suggestion or to streams of air, X-rays, etc.); they may cause sensations which have never before been experienced, which patients are unable to describe; they may cause processes in the body, such as skin eruptions, piles, etc.

The peculiarity of these symptoms is that patients sometimes complain of them without ascribing them to any external, persecutory cause. It therefore seems probable that the "apparatus" is a final form taken by regressive symptoms which began in simple changes of feeling. There are even cases constituting real transitions between these extremes. In some instances patients believe that they themselves cause the abnormal experiences and in these the author sees a parallel to that period of development where, in the process of choosing an object, the person projects his ego into the external world; and the author adduces a schema showing seven stages in the delusional formation, corresponding to successive developmental levels. The connection between the ideas and the apparatus having been thus indicated, the author proceeds to consider the forms which the apparatus assumed. He omits the magic lantern as being of too rational construction to readily permit inferences as to the significance of the delusion. In general two facts are salient in connection with these apparati: (a) they are of obscure construction; patients have difficulty in forming a clear idea of the parts and have an impression, like that in the dream, of feeling rather than of understanding the construction; (b) the apparatus is always a machine, and a complicated machine. The psychoanalyst will not doubt for a moment the symbolic nature of this formation, and in this connection Freud recently gave utterance to a definite opinion. He states that all complex machines in dreams represent the genitals—a view confirmed by the author's own experiences, who goes even further, saying that these machines always represent the genitals of the person's self and are onanistic dreams, being dreams of flight from onanism; the addition of successive parts

represent successive measures taken to resist the masturbation wish. In illustration of this interpretation of the "apparatus" in schizophrenia, the author describes his case. The patient, FrI. Natalija, a student in philosophy, described the machine by which she was influenced as having the form of a human being. She believed that there were male machines of this sort for influencing females and female ones for influencing males. At first her machine possessed genitals but later lost these organs. She could not recognize from the face whom the machine resembles—a significant circumstance, for it is well known that in dreams unrecognizable persons always represented the dreamer. Here, then, instead of the genitals merely there is a whole person, mechanically constructed and representing the patient's self. To further establish the analogy between the machine in the dream and the apparatus in schizophrenia the author calls attention to some of the features of schizophrenia. It may be called, he says, a disease entailing the loss of the boundaries of the ego. It is because of this confusion of the boundaries between the subjective and objective world that certain delusions arise, *e.g.*, that thoughts are placed in the mind, that the patient's thoughts are known to others, etc. There is a period in the early life of human beings entirely parallel to this, when they believe that the patients or those who take care of them control their thoughts and acts. Indeed, when the child first discovers that he can do something without the assistance of others he is filled with joyous astonishment. Tracing the process by which the barriers of the personality are constructed which make an indivisible psychic entity of consciousness, the author states that this independent existence may be considered to begin with the finding of the object in connection with the attainment of satisfaction for the appetites and cravings or with the failures to attain such satisfaction. Consciousness of self is a gradual realization that a world exists which is in a high degree independent of the ego. Though Tausk is unable to convince himself that in this process the sexual tendencies play a greater part than the nutritional, he is of the opinion that they have a very specific and easily recognizable rôle therein. There is then, he says, a period when there is no sexual object for the individual, and at the same time no external world. At this time, too, there is no clear consciousness of subjective existence, but there are, nevertheless, wishes and cravings and expedients for satisfying them. Immediately preceding the discovery of the object there is a stage when tentatives are made in the direction of this discovery—a stage of the identification of the person's own body with the external world. It may therefore be assumed, Tausk states, that the projection of the patient's body in his case is a pathological regression to that psychic stage in which the infant proceeds to the discovery of his own body in making use of projection. Carrying the analogy a little farther along the same lines, he is of the opinion that, that just as in normal development there is an original narcissistic libido position which has to be given up under the influence of the instreaming external stimuli, so the pathological pro-

jection takes place because there is a regressive accumulation of narcissistic libido, or an unsurmountable fixation of the same. According to this assumption the projection of the patient's own body could be a defense against a complete return to a libido position corresponding to the foetal and beginning of the extra-uterine development. This viewpoint permits the explanation of various schizophrenic symptoms. For example catalepsy, *flexibilitas cerea*, etc., may be considered to correspond to those developmental stages in which the person does not yet realize that his organs are his own and is impelled to leave them to the power of foreign agents. In contrast to these conditions would be the symptom that the person's limbs are actually moved by outside forces. The catatonic condition would be the stage in which there is complete renunciation of the external world, corresponding to regression to the level of existence in the mother's body.

These regressions of the libido often extend to the period before there is centralization in the genitals, to the prenatal and early postnatal period when the whole body is diffusely libidinous. The author believes that when these facts are taken into consideration the apparent inconsistency between the dream, where the machine represents the genitals, and schizophrenia, where the apparatus represents the whole body, vanishes entirely. At the level of schizophrenic regression the sexual libido resides in the body as a whole, is diffuse, and belongs to various areas; in the language of later genital differentiation, the whole body is a genital. [C. Willard.]

Freud, S. MOURNING AND MELANCHOLIA. [Internat. Ztschft. f. a. Psychoanalyse, Vol. IV, No. 6.]

Freud here compares the normal affect of mourning with pathological melancholy. In descriptive psychology, he says, the idea of depression or melancholia is very indefinite, appearing under a variety of clinical pictures which it seems almost impossible to subsume under a single entity. To gain unity of view he emphasizes the resemblances of the two conditions. The mechanism of mourning may be described as follows: the reality test shows that the loved object no longer exists and gives the command that the libido must be withdrawn from it. This arouses opposition, for human beings do not willingly give up a libido position even when there is a substitute. The opposition may be so strong that there is a pathological reaction—the reality principle is deflected and the object is retained in the form of a hallucinatory wish psychosis. In the normal course, however, the respect for the reality test finally gains the victory. Melancholia may, like mourning, be the reaction to the loss of a real object but in some instances the object lost is not recognized and may be considered unconscious. In mourning there are retardations and loss of interest in the environment for a certain period; in melancholia there are the same retardations and absence of interest, but here seemingly without cause. But the symptom which above all others distinguishes pathological depression from mourning is the prevailing idea of

unworthiness. Depressed patients believe themselves morally lost, reproach themselves with all sorts of shortcomings, and stand in constant fear of punishment. They extend their self-accusations over the entire past and future, believing themselves wholly beyond redemption. They refuse food and achieve the very remarkable conquest of that fundamental instinct which makes all living things hold fast to life. From the analogy with mourning one would be led to conclude that depressed patients have suffered a loss in the form of an external object; from their own statements it would seem that they have suffered a loss in their own ego—a part of the ego seems to have split itself off, to have opposed itself to another part and to be sitting in critical judgment on that part. From close attention to the complaints of these patients, however, it becomes manifest that the reproaches ill fit the patient's self, or that with slight modifications they fit another person better, some one whom the patient loves, has loved, or ought to love. And here we have the key to the disorder. The reproaches are really directed against a loved object. A real injury has been suffered from this object; disillusionment follows; but the result is not the annulment of the libido; it results only in a displacement of the same, not in the direction of a new object, but toward the ego itself, where there is an identification of a part of the ego with the object that has been renounced. The shadow of the object falls athwart an element of the ego, as it were, so that this element is judged by a critical component as an object apart. In this way it is that the loss of the object is transformed into a loss of the ego. The conditions rendering possible this displacement is that the emotional endowment should never at any time have been very stable and that the first choice of the object should have been made on narcissistic grounds. Identification with the ego is the primitive manner of choosing an object and the emotional expression toward the object is originally ambivalent, taking the forms of both tenderness and cruelty, as revealed in the oral or cannibalistic level of the libido connected with taking food. Abraham, therefore, rightly refers to the refusal of food by persons suffering from melancholia to a taboo connected with the cannibalistic level.

The ambivalence solves the riddle of the tendency of depressed patients to commit suicide, which makes this disease so interesting and so dangerous. The analysis of melancholia teaches that a person can only kill himself, when through the recoil of the emotional endowment belonging to the object, the self is valued as an object. In this case sadistic tendencies in the person's self are turned against the ego which has been identified with the object and complete satisfaction of the sadism is found in the self-accusation and attempts at self-injury.

One of the most remarkable peculiarities of melancholia and the one which is most in need of explanation is the tendency to turn into an exactly opposite condition, *i.e.*, into mania. One would be inclined to exclude instances of this sort from psychogenic affections altogether were it not for the fact that psychoanalysis has been successfully used in the

treatment of cases with cyclothymic course, thus not only permitting the extension of the explanation of depression to mania, but making this extension imperative. Both affections are due to the same complex, which in depression has overcome the ego, while in mania the ego is triumphant, in analogy with what happens in alcoholic intoxication when the repressive forces are broken down. The obvious ambivalence in melancholia point to the unconscious system as the theatre of the conflicting affects. There are three conditions connected with melancholia: (1) Loss of sleep. (2) The ambivalence conflict. (3) The regression of the libido to an earlier level. The first two conditions are met with in mourning when pathological features of self-accusation develop, but in these cases the manic phase is never encountered so that this latter reaction must be essentially connected with the third condition, the regression of the libido to the narcissistic level. It may be that the conflict in the ego acts like a painful wound calling for an extreme counteractive energy resulting in the manic phase. The author, however, remarks that more insight must be gained into the economy of the physical processes before they can be used to explain their psychical analogies. [C. W.]

OBITUARY

DR. JOSEPH FRAENKEL

At the time of Dr. Fraenkel's death the JOURNAL made an effort to gather some facts concerning this brilliant neurologist, but without success. It was bruited about that it was against his desires to have any obituary notices, but we have felt that some record of this man's work should be made. We therefore reprint a letter of Dr. Dana's which appeared some time after Dr. Fraenkel's tragic death—tragic not so much in its external features but as indicative of a soul tragedy which modern analytic methods are uncovering, let us hope for the betterment of the human race.

When with Claude Bernard we can all hope that "some day the physiologist, the philosopher, and the poet can speak the same language and understand one another"—when that day arrives a true medicine will be born, a medicine which Hawthorne in his *Scarlet Letter* forecast when he said, "A physical disease, which we think of as a thing apart and separate, may after all be but a symptom of an illness in the spiritual part of our nature." It will take many years for the physiologist to see what the poet sings about, and the crowd—that collection which gets together at the lowest of levels of self-interest—to know what part the milieu, the personal environment, plays in causing spiritual illness and physical death.

To the Editor of the Medical Record:

SIR: The character and career of the late Dr. Joseph Fraenkel deserve more than ordinary comment and appraisal. They have received little or none. Yet not long ago and for a good many years he had a commanding practice among the most intelligent and wealthy members of this New York community. His success in diagnosis and treatment, his quiet efficiency in securing results, his acuteness of observation and his complete confidence in his methods, impressed his patients and they held him in an almost God-like reverence.

For a good many years Dr. Fraenkel was an associate of mine in dispensary, hospital, and teaching work, and I held him as one of my choicest friends. His social qualities were compelling and unique. He was full of enthusiasms which he clothed with pic-

turesque language and endowed with humor and eloquence. He loved music and literature and art, and at a dinner table was an unflinching stimulus to a joyous and esoteric conviviality.

He was a very thoroughly educated and broadly trained physician. In the early years of the Montefiore Home he gave much help to the organization and development of the neurological and general medical work.

As associate professor of neurology at Cornell I knew he could teach and interest students better than myself and I lamented his withdrawal. He must be given merit as of the band which organized the New York Neurological Institute.

In his later years, after he left the Neurological Institute, he pursued an extraordinary and successful career as a neuroendocrinologist and more especially as a therapeutic individualist. What he accomplished, what he knew, how far his methods were psychical and suggestive, how far they were pharmacological, I do not know. I hope someone can tell us. He was believed to achieve dramatic and notable results by very unusual methods. Whether he did or not, his character was to me always that of a sincere, honest and lovable and loyal man. I lament his loss; and I hope there will some time be written a competent story of his life. There has been no career quite like his in the history of the New York profession of medicine.

CHARLES L. DANA.

New York.



HEINRICH IRENAEUS QUINCKE

The death of Heinrich Quincke signifies the removal of a veteran in the field of medicine. The firmness of purpose with which he pursued his work, the unswerving thoroughness with which he carried through the tasks which he conceived have left their firm impress upon neurology as upon other branches of medicine. He saw problems in their wider relations but he saw them, too, with no neglect of their deepest significance. By character and by training he was stern with himself in his adherence to his chosen tasks and no less firm in his guidance of others. Behind this was his loyalty and such a pliant interest that it bent itself to the needs of all with whom he worked for their aid or their instruction. His lectures were

comprehensive, clear in their unraveling of tangled problems. But above all his clinical work as it chiefly occupied his attention revealed that power of investigation and of instruction which made him the revered teacher and brought his work to the fulfilment which has enriched all branches of internal medicine. It is his work upon angioneurotic edema and more still his study of the cerebrospinal fluid which constitute his chief contributions in the field of neurology. His study and development of lumbar puncture are of signal importance.

Quincke was born in 1842 in Frankfurt-on-the-Oder and as the son of a physician received a carefully directed education, including a practical trade as well as preparation for his scientific work. He was a student at the universities of Berlin, Heidelberg and Würzburg. He served as assistant for some years at Berlin and in 1873 proceeded to Berne as professor ordinarius. Later he became successor to Bartel in Kiel and spent the remainder of his active life in North Germany.

HERMANN RORSCHACH

Psychiatry and psychology have suffered a loss along their most advanced lines in the death of Hermann Rorschach. His death in April, 1922, from a complicated form of appendicitis cut him off in the earlier years of an actively creative life. He was a man of an inventive mind with an unusual power of vision into the possibility of new methods of psychologic research and of application of newly discovered principles to actual psychiatric and psychologic problems. The flexible form of his interest, the human character of his comprehension of psychiatry and psychology led him into a wide field of research and made him a leader of great promise.

He applied himself to the investigation and the technical development of a method of perception diagnosis by the use of color daubs chosen as tests for reactions in regard to form, color or feelings of movement. He proceeded thoroughly and cautiously so that he was able to prove a certain regularity in the reactions of an individual which are of determining value for disease forms, grade of development or for psychological types in a more general sense.

His *Psychodiagnostik*, published in 1921, contains a description of his method and of the results obtained. He early distinguished himself when in his first position in the institution for the insane at

Münsterlingen he published his dissertation upon "Reflexhalluzination." He is known also for his work on the "Geschwülste der Zirbeldrüse." The character of his interest is manifested further in his extensive studies of the nature of the various sects of Switzerland, the results of which have been only partially made public. His active mind led him on also into psychoanalysis where he became a prominent worker as well as a promoter of the psychoanalytic organization in Switzerland.

Rorschach was a native of Zürich, being born there in 1884. His medical studies were carried on in Neuenburg, Berne and Berlin, while his final examinations took place in his native town. After a number of years of service at the Münsterlingen institution and a brief period of activity at Moscow, having married a colleague in Russia, he assumed a position in the institution at Berne but soon after removed to Herisau. Here as assistant physician in the cantonal institution he carried on his productive work from 1915 until his removal by death. The loss of his initiative and of his force of mind is an immeasurable one. Yet he has left those who had already received his inspiration and training to continue in the paths which he had opened.

JELLIFFE.

DR. AUGUSTUS DÉSIÉ WALLER

Prof. A. D. Waller, who died on March 11, 1922, at his home in St. John's Wood, was the son of a physiologist of European reputation, and performed the rare feat of becoming as distinguished as his father in his own subject.

Born in Paris on July 12, 1856, when his father, Augustus Volney Waller, was in his fortieth year, Augustus Désiré was educated at the Collège de Genève, going on to Aberdeen and Edinburgh Universities, and taking his M.D. at the latter university in 1881. His father began his professional life as a general practitioner in Kensington, and the son also soon abandoned medical practice to devote himself entirely to physiological research, a decision which became final after his removal to London and his marriage to Alice Mary, second daughter of the late George Palmer, M.P., of Reading. In 1883 he began his long association with the teaching schools of London University, first as lecturer on physiology at the London School of Medicine for Women, and then for sixteen years at the

Medical School of St. Mary's Hospital. Finally, he was appointed director of the Physiological Laboratory established in 1902 by the Senate of London University with the aid of generous donations for equipment and maintenance from members of the Palmer family. This laboratory was intended to serve the double purpose of affording to university lecturers and other accredited physiologists a place to present the results of current research by lectures and demonstrations, and of providing advanced students with opportunities of research. In 1921 the London County Council, having decided not to renew its annual grant of £500, the Senate proposed to close down the laboratory as the university could not afford to make up the deficiency. The protest from physiologists throughout the country was no small tribute to Waller's work and that of his assistant director, Mr. W. L. Symes, and resulted in the rescission by the Senate of its decision and a vote of an increased annual grant from the university of £1000. Unfortunately Waller's death interrupted his effort to raise a capital sum of £100,000, or an annual income of £5000, to place the laboratory on a safe and permanent financial basis, for such an accomplishment would have fitly perpetuated his memory.

Waller's earliest piece of research was done at Leipzig on the blood tension in the auricles; throughout his life the circulatory mechanism retained his interest, his touch with clinical cardiology being maintained by a position on the staff of the Westmoreland-street Heart Hospital. This close association in his own person between physician and physiologist resulted in the first successful attempt to display by means of a mirror galvanometer the currents generated in the living heart, and laid the basis of the whole of modern electrocardiography. Following the work of the Hyderabad Chloroform Commission, he investigated the dangers of chloroform anaesthesia, conclusively showing that these did not depend so much on the total dose administered as on the percentage of chloroform vapor in the inhaled air. He continued to hold the view that chloroform administered according to his methods was the safest anaesthetic. His investigations into the electrical phenomena of plants were interesting in themselves, and in relation to the controversy with Sir J. C. Bose as to whether his "crescograph" showed the movements of growth in living plants. Waller insisted that the phenomena were not vital, but could be seen equally well when plants killed by boiling, or fiddle-strings, were similarly excited. In the last two years Waller used the same electrical methods for demonstrating the existence and degree of emotional states. His work

seemed to show that in normal persons the apprehension of pain caused a greater effect than pain itself, and that emotional states might be revealed against the will of the patient, and so used for forensic purposes. Record of all these researches was made at the time in our own columns.

Waller was a clear and convincing writer. Apart from his Introduction to Human Physiology, on which countless medical students have based their subsequent studies, may be enumerated lectures on Animal Electricity (1897), Signs of Life (1903), Physiology the Servant of Medicine (1910), the Psychology of Logic (1912), and numerous scientific papers in the Proceedings of the Royal Society and the *Journal of Physiology*. In many of these the central aim is apparent to establish more intimate relationship between physiologist and physician, the man who "wants to know" and the man who "wants to help." In none of them it comes out more clearly than in his Hitchcock lectures delivered in 1909 at the University of California.

The academic honors which attended a useful and industrious life were many and various. Professor Waller was corresponding member of the Société de Biologie, Paris, of the Physiological Society of Moscow, and of the Royal Academies of Medicine in Rome and Brussels. For his electrocardiac work he became Lauréat de l'Institut de France. He was a F.R.S., as his father was before him.

The funeral took place at Marylebone Cemetery on March 15 in the presence of a large concourse of distinguished people.

Lancet, March 18, 1922.

NOTES AND NEWS

Dr. Edward A. Sharp of Buffalo has been appointed Professor of Neurology in the University of Buffalo, to take the chair of Dr. J. J. Putnam, resigned.

Dr. Kurt Goldstein of Frankfort, Privat Dozent of the University and director of the Neurological Institute has been appointed Assistant Professor of Neurology and Psychiatry.

Prof. W. Weygandt of Hamburg paid a short visit to the United States in October. He addressed the Clinical Society of Mt. Sinai Hospital, the New York Psychiatric Society and gave some illustrated talks on Newer Methods of Treating Paresis, and on Psychopathology and Art.

The Central Neuropsychiatric Association held its first meeting at Rochester, Minn. Oct. 21, 1922, under the Presidency of Dr. Peter Bassoe of Chicago. Dr. Karl M. Menninger of Topeka, Kans. is the Secretary-Treasurer. The following program was arranged:

Neurologic Medical and Neurologic Surgical Clinics.

1. "Experiments on the Etiology of Epidemic Hiccup," Dr. Edward C. Rosenow.

2. "Encephalitis Epidemica," Dr. Charles R. Ball.

3. "A Case of Left Frontal Brain Abscess Simulating Tuberculous Meningitis," Dr. Ernest M. Hammes.

4. "Observations on the Reaction of Neurosyphilis to Treatment," Dr. John H. Stokes.

5. "Facial Paralysis Associated with Periodic Facial Edema," Dr. Walter D. Shelden.

6. "A Case of Infantile Progressive Spinal Muscular Atrophy (Werdnig-Hoffmann type) with Necropsy Findings," Dr. Joseph C. Michael.

7. "Tumors Involving the Fourth Ventricle of the Brain," Dr. Harry L. Parker.

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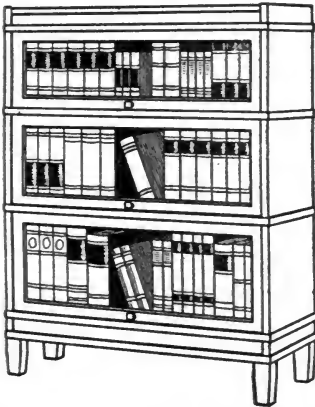
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ORIGINAL ARTICLES

CLINICAL PATHOLOGIC REPORT OF A CASE OF PONS HEMORRHAGE (TYPE FOVILLE)*

G. B. HASSIN, M.D.

ASSOCIATE PROFESSOR OF NEUROLOGY, UNIVERSITY OF ILLINOIS, COLLEGE OF
MEDICINE

HISTOLOGIST TO ILLINOIS STATE PSYCHOPATHIC INSTITUTE
ATTENDING NEUROLOGIST, COOK COUNTY HOSPITAL, CHICAGO

AND H. ISAACS, M.D., AND M. COTTLE, M.D.

RESIDENT PHYSICIANS, COOK COUNTY HOSPITAL, CHICAGO

Hemorrhages in the pons are much less common than in the brain, such as in the region of the internal capsule, for instance. According to Millard (1) Rochaux found among 130 cases of intracranial hemorrhages only six instances in the pons, and Andral, according to the same authority, saw but nine cases among 386, while Dana (2) found among fifty cases only two in the pons.

The clinical picture of pontine hemorrhage is remarkable for its polymorphism resembling in some, though rare, cases that of ordinary capsular hemiplegia [Nothnagel (3), Dana (2)]. In the great majority of cases, however, it exhibits a characteristic clinical picture of so-called hemiplegia alternans, a term introduced by Gubler in 1856 (4).

The hemiplegia alternans, type Millard-Gubler, came to be known as hemiplegia alternans inferior, in distinction from hemiplegia alternans superior (Gubler-Weber type). In 1858, Foville described another pontine syndrome which Grasset (6) in 1900 proposed to call syndrome Foville. This represents the Millard-Gubler syndrome

* From the Pathology laboratories of Illinois State Psychopathic Institute and Cook County Hospital, Chicago.

combined with paralysis of the external (VI nerve) and internal recti muscles (III nerve) of the eye (corresponding to the side of the lesion), strabismus and diplopia consequently being absent.

In 1901 (7) and more fully in 1903 (8) Raymond and Cestan described a pons syndrome in which hemiplegia was associated with contralateral involvement, usually very slight, of the V, VI, or VII nerves and sensory disturbances (loss of deep sensibility and hypalgesia in the V nerve area) combined with incoördination, tremor, athetosis, asynergy and other signs of cerebellar disturbances. The syndromes of Millard-Gubler, Foville, Raymond-Cestan, indicate not only a lesion of the pons, but also of a definite portion of the same. Thus, Millard-Gubler type denotes a lesion of the basal portion of the pons; the Foville type—the tegmental portion of the pons; the type Raymond-Cestan—likewise the tegmental portion, but its lateral portion including the cerebellar pathways.

The polymorphism of the clinical picture of pontine hemorrhages is thus due to the part of the pons involved, its extent and severity. The case to be reported is an instance of pontine hemorrhage, type Foville, which presents interesting clinical and pathologic features.

Report of Case. A fifty-two years old colored female, with good family history, entered the neurologic service of Cook County Hospital on October 18, 1920, complaining of swelling and numbness of the right half of the face, weakness and numbness of the entire right half of the body, buzzing in the right ear and difficulty in walking, speaking and swallowing.

On the day prior to admission, she suddenly became dizzy and felt numbness in the right half of the body. She had not lost consciousness, nor had convulsions. She denied venereal or any other infection and also miscarriages. Five years previously she had "kidney trouble."

Examination. The face was disfigured, its left half was flat, the left corner of the mouth drooping, the nasolabial fold on the same side obliterated, the forehead (on the left side) could not be wrinkled. The left eye was kept open and could not be closed, while the right eye showed a tendency to drooping—she could not keep it fully open for a certain length of time.

The pupils were equal and regular, but contracted and failed to react to light or in accommodation. The conjunctival and corneal reflexes were lost on the left and present on the right. Both eyes were turned toward the right, could be moved up and down and to the right, but not to the left. There was a slight horizontal nystagmus.

The movements of the jaws, head, tongue, soft palate and pharynx were normal, but the taste sense in the anterior part of the tongue, as well as the sensibility and the reflexes of the soft palate and pharynx were lost.

The right leg and arm were incompletely paralyzed, movements in both these extremities being possible but very weak. The tendon reflexes were present on both sides, without Babinski, Oppenheim or other pathologic phenomena. Brudzinsky and Kernig signs were absent, as were atrophies or trophic disorders.

Sensibility of the entire right half of the body, including the face, showed greatly diminished sensation for pain and touch, while the *temperature sense was preserved*. Stereognostic, localization, and position senses were lost on the right, the patient being unable to tell change of position in her right fingers, hand, forearm, leg and toes. The left side of the body showed no abnormalities whatever, as to the motor or sensory system.

The heart was enlarged, the second aortic sound accentuated, the first sound replaced by a murmur. The lungs, gastrointestinal,



Fig. 1: The hemorrhagic focus in the tegmental region causing marked protrusion of the floor of the fourth ventricle. (The tissues are somewhat disfigured as the brain was poorly preserved.) Photograph of an unstained specimen.

genitourinary organs, mentality were normal. Blood pressure was 210 systolic and 120 diastolic.

The urine showed albumin and a few granular casts. The spinal fluid: absence of globulin, eight lymphocytes per cubic millimeter, a negative Wassermann reaction which was also negative for the blood. The temperature was normal, the pulse 88, respiration varied from 24 to 36.

The vestibular apparatus (by Drs. Novak and Profant) had been examined twice, on October 22 and 24, in the ear service of Cook County Hospital. The caloric tests revealed normal vertigo and past pointing from both right and left horizontal canals and a feeble nystagmus from the right horizontal while the left horizontal did not respond by nystagmus at all. The vertical canals gave a feeble response in both nystagmus and past pointing.

Summary. (1) Complete left sided facial paralysis (of the peripheral type); (2) paralysis of left lateral movements of the

eyes (persistent deviation to the right), that is, of the left external and right internal muscles; (3) contracted and fixed pupils; (4) right sided hemiparesis and hemianesthesia with involvement of sensation for pain, touch, position, stereognosis and localization, but with preservation of the temperature sense; (5) involvement of problematical fibers from both vertical labyrinthine canals and partial involvement of the fibers from horizontal canals, especially the left one.

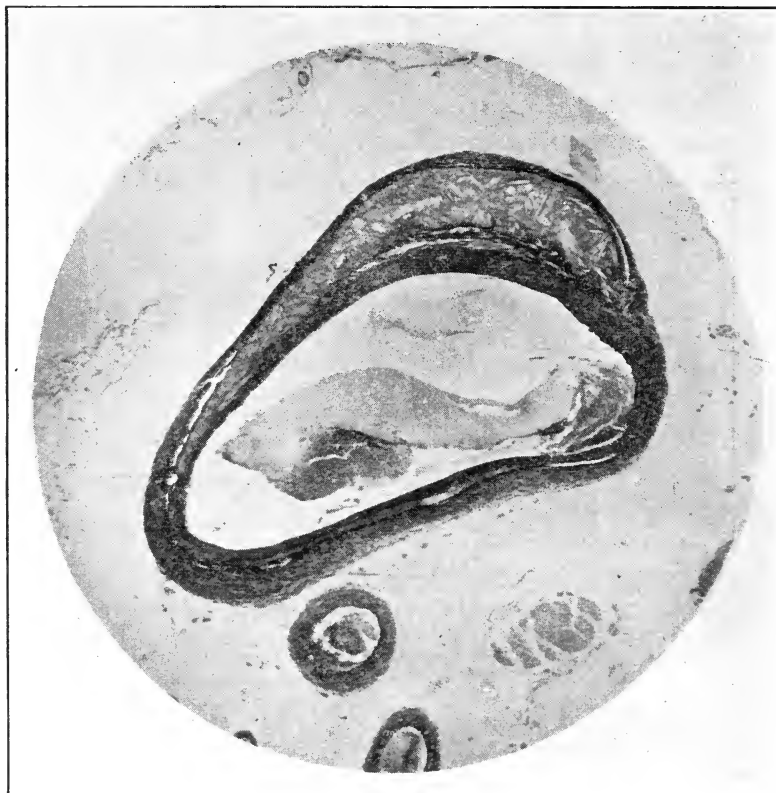


Fig. 2: Arteries of the base; the larger one is the basilar artery which shows no evidences of syphilis (absence of cellular infiltrations of its layers), but shows marked arteriosclerotic changes (thickened and hyperplastic intima, splitting of the elastica and even changes in the media (hyaline-like mass between the internal and external elastica fibers). Weigert's Resorcin-fuchsin stain X 21.

The patient died from bronchopneumonia on the eleventh day after admission and the twelfth day of her illness.

Macroscopic and microscopic reports (Dr. Hassin). The post-mortem examination revealed a hemorrhagic focus (three-fourths of an inch by one inch in size), in the left tegmental region of the pons (Fig. 1) occupying an area containing the nuclei and roots of the

sixth and seventh nerves, the left posterior longitudinal and praedorsal bundles, the reticular formation, the main or mesial fillet and partly the fibers of the descending root of the fifth nerve.

The focus was confined strictly to the foregoing region and did not transgress the raphe from which it was separated by a narrow normal zone. It did not involve the fourth ventricle into which the floor was markedly protruding (Fig. 1). Nor did the hemorrhage transgress the annular or basal portion of the pons. In front it

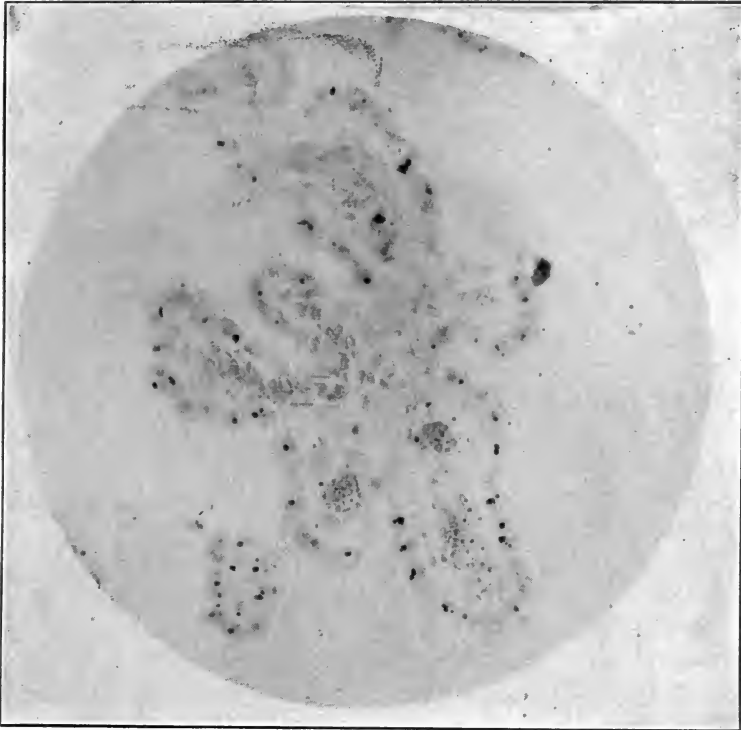


Fig. 3: Choroid plexus (of the fourth ventricle) with fairly large globules of haemosyderin in the tuft-cells. Alzheimer-Mann stain X 300.

reached the region of the posterior corpora quadrigemina and did not involve the lateral lemniscus, the brachia conjunctiva or the spinocerebellar tracts. The horizontal extension of the hemorrhagic focus, near the artificial cut, corresponded approximately to the area occupied by the spinotectal and spinothalamic tracts which thus have been affected.

The basilar and vertebral arteries were markedly sclerosed (Fig. 2) and patent while the microscopic examination of the rest of the brain tissues showed no changes suggestive of syphilis or tuberculosis, nor any parenchymatous or inflammatory phenomena.

The temporal lobes and the cerebellum were excessively vascularized, the pia mater was thickened, containing, especially around the paracentral and frontal lobes, an abundance of fibroblasts, mesothelial cells and masses of granules of hemosyderin. They were mixed with a few lymphocytes, but no plasma cells could be found. Hemosyderin granules were likewise found in the perivascular adventitial spaces of smaller vessels and capillaries of the medulla, of the white brain substance (especially of the occipital lobe) and, in larger quantities, in the epithelial, tuft cells, of the choroid plexus (Fig. 3) which appeared grossly vacuolated.

The spinal cord and the abdominal organs could not be examined because of the restrictions placed on the postmortem examination. It was assumed that the principal pathologic lesion was in the nature of arteriosclerosis of the brain with subsequent rupture of the median branch of the basilar artery.

DISCUSSION

A typical Foville syndrome has been associated clinically with fixed and contracted pupils, dissociated touch and temperature sensations, slight hemiplegia, low temperature, interesting vestibular findings, and pathologically with the presence of blood pigment in the subarachnoid space and choroid plexus, and a well defined hemorrhagic focus in the left tegmental region of the pons. As the latter involved the nuclei and roots of the *left* sixth and seventh nerves, their paralysis is easy to understand. The simultaneous involvement of the *right* internal rectus was most probably due to involvement of the left posterior longitudinal bundle whose fibers connect the nucleus of the left sixth nerve with that of the fibers for the contralateral internal rectus muscle. The external rectus and the contralateral internal rectus muscles, though supplied by different nerves (sixth and third) are both dominated by one common center which according to Bechterew (9) is located in the second frontal convolution and is represented solely by the nucleus of the sixth nerve. Fibers from this center run through the centrum semiovale, internal capsule and the cerebral peduncles to the pons where they decussate before reaching the pontile nuclei of the sixth nerves. Lesion of the above fibers before their decussation produces a deviation of the eyes toward the cerebral lesion and away from the ocular paralysis, while their involvement after decussation, in the pones, will produce an ipsilateral paralysis of the nerves in the present case, on the left side. The result was that the eyes had to turn to the *right* because of the action of the contralateral nerve, and away from the lesion, the patient looking at the paralyzed side of the body. The

simultaneous involvement in our case of the right rectus internus muscle which gets its innervation from the third cranial nerve was due, not to the involvement of the latter which was found intact, but, as noted, to that of the posterior longitudinal bundle. Bechterew describes fibers running from the sixth nucleus into the area of the posterior longitudinal bundle of the same and opposite sides.

While some plausible explanation can be given for the associated ocular paralysis it is much more difficult to explain the cause of the rigid and myotic pupils. That the pupils in pons lesions may be contracted is a well known fact, but rigid or sluggish pupils are rather an uncommon occurrence in pontile hemorrhage. Nothnagel (3), Wernicke (10) and Gee-Tooth (11) mention the pathologic pupillary reaction in such cases but the majority of authors have found the light reaction to be prompt. The most frequent cause of abnormal pupillary reaction, such as syphilis, was absent in our case, and the explanation therefore must be looked for elsewhere. Some authorities, Dana (2) for instance, explain pupillary changes in pons lesion, by assuming compression or irritation of the third nerve nuclei, or by probable coincident palsy of the sympathetic nerve. The experimental studies of Levinsohn (12) and others showed that irritation of the fifth nerve nuclei or of the descending root of this nerve may produce a pupillary contraction. Such an explanation, however, in our case is altogether unsatisfactory for it would not explain the *bilateral* involvement of the pupils from a unilateral pontile lesion. Lutz (13) points out that a marked myosis may obtain from an interruption of the descending fibers of the posterior longitudinal bundle which goes from the anterior corpora quadrigemina to the centrum cilio-spinale. If the lesion, he says, destroys Meynert's fountain-like crossing in the median line, it produces *bilateral* myosis; if it acts only on one side, unilateral myosis follows.

As Meynert's crossing in our case was not involved, the lesion having stopped at the level of the posterior-corpora quadrigemina, we must assume that these fibers or some other structures such as the sympathetic nerve fibers, have been either compressed by the neighboring hemorrhage or in some other way damaged and thus produced the pupillary contraction.

A better anatomic explanation might be given for the rigid pupils. They were of course due to a lesion of some portion of the pupillary reflex arc, pupillary optic fibers, corpora quadrigemina and oculomotor nerve. Here should be included the praedorsal longitudinal bundle, also called fasciculus tecto-bulbaris praedorsalis [Pavlov (14)] which according to Van Gehuchten (15) and his school

contains fibers transmitting the light reflex from the pupillary fibers and their center in the anterior corpora quadrigemina to the third nerve nucleus. As this praedorsal bundle was destroyed in our case and as it contains crossed fibers, it is highly probable that its lesion was instrumental in the causation of the frozen pupils.

It is much easier to explain the motor as well as sensory phenomena. The former were due to pressure on the pyramidal fibers, which were not destroyed, nor markedly damaged. This would account for the absence of the Babinski and Oppenheim phenomena as well as for the exaggerated tendon reflexes.

The total destruction of the left mesial or main lemniscus explains the loss of the sense of touch and deep sensibility (position and stereognostic senses); the involvement of the spinotectal and spinothalamic tracts—that of pain, while the involvement of *formatio reticularis* with its ventral tectal pathways which represent, according to Spitzer (16), the sensory pathways of the fifth nerve, will explain the sensory disturbances in the areas of this nerve (face). Preservation of the temperature sense is due to the intactness of the corresponding fibers which occupy a territory not affected by the hemorrhage. In short, this case demonstrates that the sensory pathways in the pons are dissociated just as they are in the spinal cord and that there are different fibers for the conduction of temperature sense.

The vestibular findings, absence of nystagmus, upon irritation of both the vertical and horizontal canals can be explained by the involvement of the posterior longitudinal bundle. Whether this case speaks for or against the assumption by some authors, Randall (17), Fischer (18), Jones (17), of separate pathways from the horizontal and vertical canals to the cerebellum, it is rather hard to tell, as the patient's condition did not make possible repeated or extensive examinations along this line.

Finally, a few words may be added as to the histologic features, the presence of blood pigment in the subarachnoid space and the choroid plexus. That it came to these structures from the hemorrhagic focus cannot be questioned. The pathways by which the blood pigment traveled are indicated by the presence of the pigment in the perivascular spaces by which it was carried from the brain to the subarachnoid space, just as any other foreign, useless substance is removed from the brain tissues. This problem has been discussed elsewhere (19) and here I just wish to direct attention to an additional fact which speaks in favor of the view that the unloading of

the useless cerebral substances, in this case blood pigment, takes place into the subarachnoid space.

The presence of pigment in the choroid plexus seems also to favor the view that the spinal fluid, derived wholly from the brain tissues, before being absorbed by the various channels becomes purified by the cells of the choroid plexus (20). The presence of the blood pigment in the spinal fluid is not only of academic, but also of great practical interest. For it can be demonstrated *intravivam* by means of spinal puncture and the benzidin test (for blood). In hemorrhages of the brain the spinal fluid always gives a positive benzidin test, while in embolism and thrombosis it is always negative. In my service, at the Cook County Hospital, such examinations have been carried on for the last eighteen months, and the results uniformly supported the views here expressed.

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THROMBOTIC CORTICAL AMAUROSIS *

Report of a Case of Bilateral Calcarine Softening

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Unilateral destruction (1) of the visual cortex following thrombosis of branches of the posterior cerebral artery is not an unusual condition, but very few bilateral lesions have been reported; Wilbrand and Saenger (2) collected eighteen such cases from the literature.

The following case is considered significant not only because of the diagnostic features involved but also because it appears to controvert, in part at least, the precept of John Hunter (3) on the distribution of arteries. He held that they were distributed without relation to function.

Case: E. O. M. Long Island Hospital, Boston. Age, fifty-five. White. Admitted July 26, 1920. Occupation, paper hanger. Chief complaint, blind. Family history and past history essentially negative. The following statement accompanied the patient from another hospital: "Admitted because of poor vision and loss of memory. Had taken two drinks of whiskey, immediately after which he had severe gastroenteritis and his vision began to fail. Examination at that time was negative except for blindness and loss of memory. It was thought that the supposed whiskey contained wood alcohol. Ophthalmologists feel that there is no hope of his regaining his sight. Diagnosis: Toxic amblyopia."

Examination on admission July 26, 1920: Can see something move when hand is passed before eyes, but cannot recognize objects or count fingers. B. P. 220/120. Otherwise the examination is negative. Diagnosis: Toxic amblyopia.

November 15, 1920: Referred to Neurological Service. Patient is totally blind, fundi normal, neurological examination negative, spinal fluid normal. Opinion—Cause of blindness not determined.

February 28, 1921: Developed bronchopneumonia.

March 3, 1921: Died. Autopsy: Cause of death—bronchopneumonia.

Brain: The pial vessels are slightly tortuous and are evidently sclerosed, most profusely in the large and medium-sized branches which are flecked with prominent gray and yellow areas. The sclerosis is most marked in the Circle of Willis. Shrinkage of the tips and inferior surfaces of the occipital lobes is quite pronounced. (Figure 1.)

* From the Department of Neuropathology, Harvard Medical School.

The tissues are soft and there is very slight resistance to light pressure. On horizontal section of the occipital lobes the left presents a large "cyst of softening," extending from the cortex of

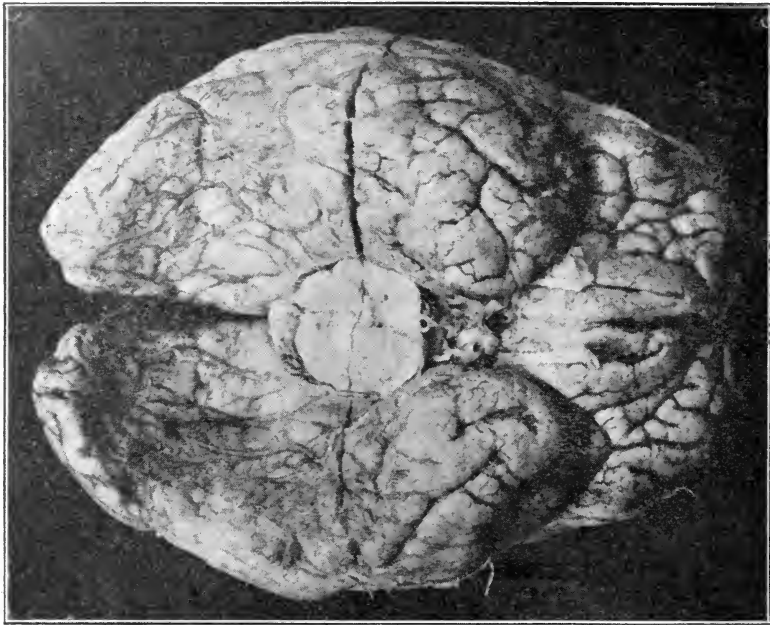


Fig. 1: Photograph of base of the brain with pia attached. The dark portions of the occipital lobes mark the areas of softening.

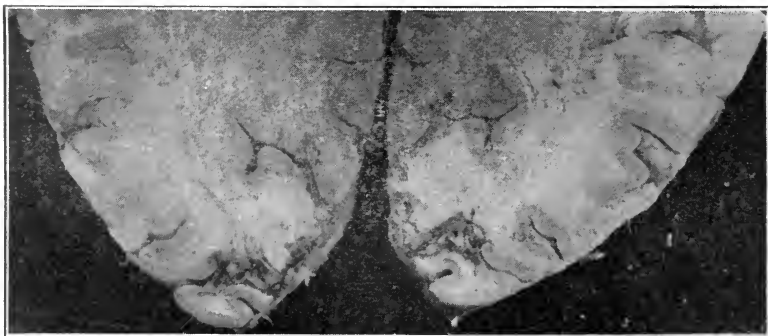


Fig. 2: Horizontal section of left occipital lobe showing the degree of "softening" in calcarine area and in the optic radiations.

the median surface inwards 1.5 cm., involving the area about the parieto-occipital fissure (Figure 2).

There are also signs of degeneration in the white matter in the optic radiation anterior to the parieto-occipital fissure. The right

occipital lobe presents a small "cyst of softening" between the parieto-occipital fissure and the occipital pole (Figure 3), with a partial destruction of the cortex about the calcarine fissure. There

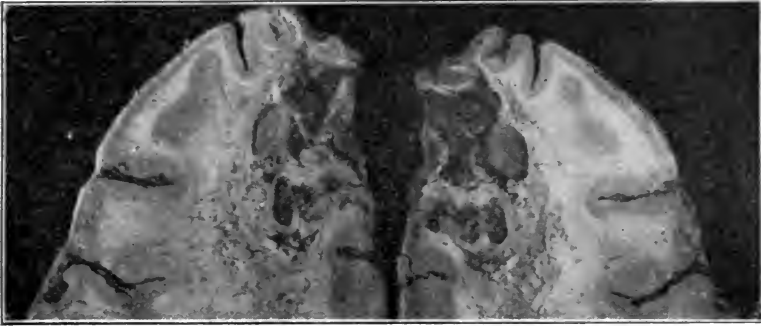


Fig. 3: Horizontal section of right occipital lobe showing the degree of "softening" in the cortex of the calcarine area and in the optic radiations.



Fig. 4: Microphotograph at anterior border of section through "cyst of softening" in left occipital lobe. Here the degree of thickening and sclerosis of the elastica with narrowing of the lumen can be observed in the large artery.

is also a slight degeneration of the white matter in the optic radiation. Wherever sections are made in the occipital lobes the blood vessels stand out prominently and are characteristic of an advanced arteriosclerosis. Figure 4 is a microphotograph of a section of Figure 3

at the parieto-occipital fissure. It illustrates the thickening of media and the narrowing of the arterial lumen to such an extent that only a scant flow of blood can reach the parts supplied, resulting in degeneration of the calcarine area. The symmetrical position of the lesions makes the cause of blindness obvious. No lesions were encountered on examination of the optic tracts anterior to the occipital lobes.

Beyond the general arteriosclerosis, the brain, cerebellum, pons and medulla appeared normal.

Conclusion: This pathological picture proves the earlier diagnosis of toxic amblyopia to have been erroneous; furthermore it presents a condition which should be considered in all cases of amblyopia before making such vague diagnoses as "retrobulbar neuritis" and "toxic amblyopia" in the absence of fundus pathology.

The case tends to corroborate the views of Shellshear,(4) who believes that the arteries of the forebrain have a functional distribution and should not only be studied from the anatomical point of view, but in relation to their functional significance which is probably of paramount importance.

In the case here reported, one finds the complete loss of a single function from symmetrical lesions of the occipital arteries.

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THE MENTAL SYMPTOM COMPLEX FOLLOWING CRANIAL TRAUMA

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(Continued from November)

On October 23, 1920, a right lateral stereo of the skull showed no definite signs of fracture, but there appeared to be a thinning of the bone in the right frontal region just lateral to the frontal sinus. An ocular examination made October 28 showed the vision O.S. 20/40, O.D. 20/30. Pupillary reflexes and tensions were then normal. There was some involvement of the third nerve as shown by limitation of the internal rectus and the levator of the upper lid. There was some decrease in the sensitiveness of the left cornea. Fundi were normal and the visual fields showed no definite disease. A subsequent ocular examination report, November 12, 1920, stated that the vision was then O.D. 20/30, O.S. 20/20, no ocular disease present, but that the examination was suggestive of a state of cerebral concussion. A Wassermann of the blood serum, on October 29, was negative. Examination of the spinal fluid, November 19, showed the Wassermann of the fluid negative; white cells, 7; globulin, negative; colloidal gold curve, 0011100000. A subsequent examination of the spinal fluid, November 27, found the same results except that the white cells were reported as 6. A vestibular test was attempted, November 7, but the patient's mental condition precluded a satisfactory examination. Hearing was reported as 20/20 bilateral.

A mental note made, November 15, stated that some improvement was seen, he showed more interest in his surroundings, memory was still defective, but he was showing more normal reactions. January 1, 1921, he was described as less childish in his reactions, his attention was readily obtained and he performed memory tests better. January 10, he was considered improving, showed interest in his environment, but was somewhat depressed, irritable and complained of headache. Again on January 18, it was noted that he remained somewhat depressed and irritable. His condition remained about the same up until February 18, 1921, when he was discharged as improved on a surgeon's certificate of disability to his own care with a diagnosis of "Traumatic Psychosis."

The injury in this case was due to a blow on the head, without fracture, and was followed by a relatively brief period of unconsciousness. He had no memory of receiving the injury, but remembered events immediately prior to it. He complained of headaches, weakness, dizziness and blurring vision. He was,—lethargic, confused, disoriented, emotionally depressed and irritable, his speech was re-

tarded and rambling and he exhibited a disorder of attention. He had auditory hallucinations and delusions of persecution by the sailor who had assaulted him and whom he had previously reported for petty larceny. He showed considerable impairment of memory and in the intellectual field. Such considerable improvement ensued that he was discharged from the hospital about four months after the injury. At that time his depression and irritability were the prominent residuals.

*Case X.** The patient B. R., was thirty-eight years of age. His family history was not only negative for mental or nervous disease of any sort but on the contrary his father and grandfather were engineers of no mean ability and his mother a refined and intellectual woman. He was reared in a good home and under surroundings which would appear to have been ideal. He had a few of the minor illnesses of childhood. In retrospect, he does not consider that he cared particularly more for one parent than the other, except one's natural fondness for the mother and admiration for the father. He attended school until the time of his graduation from a technical college of engineering at the age of twenty-one. During this time he made friends easily, was liked by all with whom he came in contact and was a robust, happy and optimistic fellow. He denied all venereal disease, perverse sexual acts or cravings, addiction to drugs or the excessive use of alcoholic beverages. Upon the completion of his collegiate work, he married and entered business for himself. Before marriage they discussed the possibility of future marital disharmony and decided to arrange a plan whereby all difficulties might be avoided. They, therefore, decided that each should have three definite evenings set aside every week to spend as each one pleased. He also arranged that she should have an independent income. Their married life was happy although they have had no children, and in the business world he was successful. He fitted up a workshop in the basement of his home in which he made practically all his furniture in his leisure hours, and when war was declared, had partially completed a book on hydrostatics from his own observations and experience. He was considered an authority on this subject by his friends and business associates. His personal friends and acquaintances include men of national repute. He obtained a captaincy during the late war.

His first injury was received in action September 27, 1918, and was inflicted by a fragment of a high explosive shell striking his helmet on the right side. He was never at any time unconscious, but only momentarily dazed, nor was there a laceration of the scalp. After this injury, he described his sensations as being entirely care free, no fear of injury, somewhat elated, carried on by the excitement of battle to such an extent that three other serious body wounds received during the engagement, while realized, were not perceived as painful. The last, an explosion, rendered him unable to continue as he was pinned down by débris. He stated that during the period following his initial injury, his orders and plan of action stood out

* Used through the courtesy of Walter Reed General Hospital.

in his mind as plain as the large type headlines of a yellow journal. The captain was decorated for bravery in this engagement and for deeds of which he had no recollection. He, no doubt, had a fragmentary amnesia lasting for a short time. After being taken back to a hospital and his body wounds dressed, he stated that for four days and nights he was restless and sleepless. Following this he fell into a profound drowsy state during which he cared very little what happened, wished to be left alone and be allowed to sleep or be quiet. This drowsy or lethargic state improved gradually until February, 1921, a few weeks after admission to Walter Reed General Hospital, when he stated that it only recurred after he had been momentarily excited. He further remarked that for a long time he was extremely irritable, little things annoyed him, had difficulty in getting along with anyone, loud voices, mannerisms and trifling matters seriously disturbed him. He noticed that he had difficulty in thinking of the right word and while groping for it, forgot what he had just said, was unable to concentrate and could not read a paper without becoming nervous. In addition he was described as being inattentive, showed emotional instability and for some time lacked insight. A summary of observations made in February and March, 1921, showed that he was neat and quiet in his appearance, usually slow and deliberate in his actions, relevant and coherent, although somewhat hesitant in his speech, sometimes found great difficulty over a simple word, started a sentence and was unable to finish it, or pondered and said, "Oh, what was I going to say? Oh, yes," and then proceeded. He was freely accessible, stated that he was moderately happy although he had been inclined to be despondent and introspective, but believed that he had improved somewhat since the first of the year. He felt that he was gradually improving and was more buoyant and had much more hope for the future. Stated that he had been indifferent towards his wife without meaning to be, but that she would understand better when the situation was explained to her. He continued irritable, sudden noises made him jump. He avoided the bustle of crowds and avoided all excitement. He asked for, and was given, a short leave to avoid some well meaning but hilarious friends. Was unable to concentrate for any great period without becoming nervous, did not wish to take up any work but occasionally joined his friends in a short game of cards. He denied all hallucinations and delusions, and his insight was fair as to his condition, and his judgment good. He was correctly oriented and there appeared to be no impairment of memory for remote or recent events except that he was somewhat forgetful concerning little things he intended to do, started somewhere and returned one or more times before he was ready to go, forgot to call someone on the telephone or forgot an appointment. He read the papers, a little while at a time, and kept up well on outside affairs of the world, as for example, stock market quotations. Intelligence tests were met on a par with one of his training and he showed a wide fund of knowledge. It was thought that there was probably no mental deterioration but a mental exhaustibility as evidenced especially toward the close of a long conversation in which he had taken an active part. It is also

interesting to note the effect produced by alcohol. One small drink was sufficient to cause an intoxication with marked exaggeration of his motor disturbances. Neurologically, he presented a longitudinal sinus syndrome, weakness of both lower extremities and left arm, and a right facial paresis. Due to the old spinal injury, he wore a supporting brace, but had no sphincter disturbances or pathological reflexes. The X-ray of the skull showed a narrow fracture line, without displacement, running across the lower right parietal bone into the posterior inferior border of the right frontal and into the base of the anterior fossa. Urinalysis, Wassermann and blood counts were all negative.

Since March, 1921, the captain has improved gradually in some respects and in others he has not. He improved particularly in regard to his aphasia and after a few months could sit and talk, rarely hesitating for a word. His forgetfulness improved and he began to go out more, seemed to be less annoyed by trifling matters and purchased an expensive car which he enjoyed driving. However, he had what he called his good days and his bad days, and began to have episodes of increasing severity lasting from a few hours to several days, representing in a milder way his condition following his return from a leave in the early part of January, 1922. At that time, he had a catarrhal laryngitis with aphonia for two or three days, showed marked loss of emotional control, was extremely irritable and so restless that he was unable to lie in bed, appeared depressed and stated that he felt as though he were going to "blow up," became so angry at times that he entirely destroyed articles, which he had been making, as for example, a box he had about completed in the wood-work shop. At such times his neurological symptoms were exaggerated, the right facial paresis and weakness of lower extremities and left arm were more noticeable. When he felt depressed he constantly complained of the tendency of his mind to run in a circle and this made him feel as though he were going mad, and he was greatly annoyed by his inability to do anything. He has had attacks of weakness which were described as fainting spells and more like a syncope than what might border on an epileptic equivalent. He swooned to the floor or slipped from his chair and then made an attempt to crawl or get to his bed as quickly as possible. He denied becoming unconscious but there appeared to be some mental obtundity following these attacks. In addition, it was reported that he imagined a fellow patient had hit him on the head with a crutch and that he feared there was someone behind him when the person with whom he was conversing turned away. Other patients reported that it was extremely dangerous to go riding with the captain as he drove the car at an exceedingly rapid and dangerous rate. He constantly complained of loss of self-control and worried about his condition. He maintained that his wife was "the best little woman God ever made." at the same time wished he had never married her. He was restless and entirely unhappy in his home and shortened his visits to go elsewhere or return to the hospital. Women have had no sexual charm for him but his impotence was not considered altogether explainable upon an organic basis. He had apparently suffered no intellectual impairment.

In the résumé of this individual's personal history, we see an adaptation at a high intellectual, social and economic plane. He was injured by a shell fragment which struck his helmet upon the right side and produced a fracture running across the parietal and frontal bones into the anterior fossa. There was no loss of consciousness. However, there was a distinct alteration in the perceptual field. He carried on in action until he was overcome by a subsequent explosion. There is probably a fragmentary amnesia as he does not remember certain deeds recorded to his credit. He was sleepless and restless for about four days and then developed a lethargy which lasted for several months. Neurologically, he presented a longitudinal sinus syndrome and a sensory aphasia. After a period of two years, but little remained of the aphasia. From the onset of his trouble he was quite irritable and was particularly annoyed by acoustic and optic stimuli. He was unable to concentrate for any length of time, was inattentive, despondent, and introspective. While he had some difficulty in remembering small matters, he showed no particular memory impairment. He was unable to tolerate alcohol as it exaggerated his motor difficulties, as did the attacks of excitement and anger which he displayed later on in the course of his illness. The opposite sex had no charm for him and he was quite restless in his home. After three years he developed fainting attacks, vague fears, ideas of persecution and an impairment of judgment, for example his driving a high powered car at reckless speed. He did not suffer intellectual impairment but did show mental fatigability.

Case XI. The patient S. K., was born May 10, 1888, in Finland, where his parents and only brother were living and well the last he knew. No psychopathic antecedents were elicited. The patient stated that he attended school about three months altogether in Finland, but was taught some things at home. His boyhood was apparently normal, was always rugged, healthy and enjoyed the usual boyhood sports. He denied the usual diseases of childhood. Assisted his father on the farm and at carpentering until he came to America, March 3, 1909, being at that time about twenty-one years of age. He gave no definite reasons for coming to America, except that some people he knew lived in New York, thought he could make more money here and wanted to see the world. He very soon got farm work to do and did such work until he was drafted into the army, earning from \$30.00 a month to extra pay when he worked in the harvest-wheat fields in North and South Dakota. He roamed about the country a great deal, going from one job to another. He worked on farms in Michigan, Iowa, Minnesota and elsewhere. Did some carpenter work at \$3.00 a day when he could get it. Stated that he was drafted in June, 1918, discharged December 1, 1918, cause not known, and reënlisted in July, 1919. Soldiered at Mitchell Field, Camp Devons and Aberdeen Proving Grounds. Said he got along fine every place he had been and that he always had been treated well.

He was admitted to the Station Hospital at Aberdeen, Md., on November 9, 1920, following a fall from a motor cycle. His admission notes showed that he was partially unconscious, that he vomited occasionally and that there was some bleeding from the right ear; he had about a degree of elevation of temperature, his pulse was 80,

respiration about 20. During the next ten days his pulse ranged as low as 56 and as high as 82. The highest temperature was 100.2°, occurring about the fifth day following the injury. Notes made November 18, 1920, showed an apparent right facial palsy and that there was a discharge of bloody serum from the right ear. He was admitted to Walter Reed General Hospital on the neurosurgical service in November, 1920, for further observation and treatment. Admission notes there showed that he complained of dizziness and headache and that he talked very little. He also complained of indefinite trouble with his head. He, however, seemed much clearer mentally than he later became. He grew quite seclusive, would sit for hours in a corner of the ward alone, sometimes looking at a magazine, the pages of which he seldom turned. He was lethargic and would sleep until ten or eleven o'clock in the morning unless he was awakened and gotten up by the nurses or orderlies; he seemed somewhat irritable, became more and more inaccessible, inattentive and disinterested. In view of the fact that he was somewhat uncleanly in his personal habits, would not bathe, and so on, he was subjected to a bath one day by others upon the ward. Following this, he seemed to think they had it in for him, became suspicious of his friends and later refused to go to bed at night and sat alone in a vacant room. He resisted all attempts to get him to go to bed, escaped from the ward and attempted to run away. After transfer to the neuropsychiatric section February 25, 1921, he was entirely inaccessible, remained apart from the other patients with his face to the wall and his head bowed over his hands. He refused food and when forced feeding was attempted he begged not to be given wood alcohol. Following this, he began to eat again, appeared a little brighter and took some interest in general ward activities, smiled at times, but seldom spoke even in reply to questions. A summary of the physical and neurological examinations showed a well nourished and well developed white male adult, age thirty-three, whose respiratory, circulatory, gastrointestinal, glandular and genitourinary systems appeared normal. There was an otitis media, chronic, suppurative, right, and a labyrinthitis, chronic, nonsuppurative, right. Cranial nerves negative, except the eighth. The right eighth showed almost entire lack of function and it was thought that this was due to a combined lesion of the conductive and perceptive mechanisms of the ear. There were no tremors, station and gait normal, no sensory changes. Deep and superficial reflexes showed no departure from the normal and no pathological reflexes were present. Laboratory findings, blood Wassermann, negative; urinalysis, negative and X-ray of skull showed no signs of fracture. The patient was transferred to St. Elizabeths Hospital May 31, 1921, with a mental diagnosis of "Psychosis associated with cerebral injury." On admission to this hospital he offered no resistance to admission procedures but had to be urged or assisted in every respect. He appeared quite retarded, expression was stolid and he at times appeared to be perplexed. To most questions he remained mute, looking away from the examiner. To questions as to why he did not speak and appeared to be worried, he stated that he was among people he did not know. He was approx-

imately oriented as to time and place. On account of the patient's inaccessibility, the routine history and mental examination was postponed until July 22, 1921, when it was noted that he came to be examined willingly but came into the office very slowly. He was negative, remained seated in his chair and did not volunteer any information; however, he seemed to comprehend the general situation. He made no reply to many of the questions and was unable to furnish any history. Upon the ward, he was seclusive, gave no trouble, was always quiet and orderly and obeyed the usual routine ward rules. He spent his time in doing occupational work, in which he seemed much interested, and he has been very efficient. He ate his meals regularly and looked after his personal wants. His general psychomotor activity was diminished but he showed normal motor reaction while he was working. His stream of talk was very meagre and he was at times mute. He spoke slowly and with effort in a low tone of voice in answer to some questions. He had a foreign accent but no speech defect. His responses were relevant. Questioned as to his complaint, he replied after a long pause, "Ain't got nothing." A question as to his occupation was repeated four times without response. Emotionally, he appeared somewhat confused, depressed and intimidated that he was not happy. His general attitude was respectful but somewhat indifferent. He was inaccessible to routine mental examination but coöperative in other respects. No delusions or hallucinations were elicited at that time. His insight could not be determined. No change was noted in his physical or neurological status except that his hands appeared somewhat cyanotic. Urinalysis and Wassermann of the blood serum were negative. August 21, 1921, it was noted that the patient appeared somewhat brighter and an attempt to interview him was made. He was somewhat more accessible than formerly and the somewhat meagre family and personal history was obtained. He remembered about his fall from the motor cycle and later (he did not know how long) his trouble in trying to stand up and get his motor cycle on the road, then being dizzy and later waking up in a hospital at Aberdeen. No description of his subjective symptoms could be secured. It was thought his difficulty in expression aphasic, as he occasionally took a pencil and wrote out a word he wished to use. He said he felt all right, was not sad and was sent to the hospital because he hurt his head but did not think he was "crazy." Denied all sorts of hallucinations and delusions. Said everyone treated him well and that he liked it here, would like it better if he could walk about the grounds as he pleased and would not run away, that if the doctors would let him he would go to his friends in New York and get a job. He was correctly oriented, gave correct answers to simple calculations, somewhat laboriously, but did not coöperate in special memory and intelligence tests. At that time he was quite neat in his personal appearance and continued working in the occupational department, making toys, etc. In October, 1921, he began gradually to show less interest in his work, only doing something when urged. Spent most of his time in absolute seclusion, was stretched out on benches for hours at a time, and was somewhat careless in his personal appearance, was disoriented for

time and appeared quite depressed. He continued with little change of any sort. December 30, 1921, he said he heard "voices" but would not tell what they said. On January 13, 1922, an extended effort to get the patient to cooperate on a mental examination led shortly to considerable irritability on his part. He, at first, answered a few questions pleasantly; as to his health, replied with a smile, "I be all right"; as to what he was doing, "Weaving" (rug weaving). He made no complaint about his food and stated that he slept fine. He did not speak spontaneously, except once when he asked, "Doctor, how about I have parole?" Denied hallucinations and delusions, was approximately oriented, and showed considerable affect when asked about the motor cycle accident, placed his head in his hands and cried. When asked why he cried, replied after a time with a tearful smile, "Nothing matter." He performed simple mechanical tests well, although slowly. Named objects correctly, such as "pencil," "pipe," "door-knob," and "paper." Pointed out "woman and baby" in a picture. Answered written questions, such as, "How old are you?", etc. Repeated aloud simple sentences of ten or twelve words after the examiner, read a few printed lines correctly, but afterwards, when asked, did not say what he had just read and was not led to cooperate further, became quite irritable on repeated questioning and occasionally replied irrelevantly, "No, I'm all right," or "Nothing matter with me." He has continued with little change.

Here we have an individual, of foreign birth and poor educational advantages, who had, however, adjusted well in America at the economic and social level for which he had been trained. He received his head injury in a motor cycle accident and was "partially unconscious" on admission to the hospital. It was noted that he vomited occasionally, that there was some bleeding from the right ear and that he had an elevation of temperature with slow pulse. In addition, there was a right facial palsy and he complained of headache and dizziness. There was no spontaneity in his speech and he became seclusive, inattentive, lethargic, irritable and inaccessible. He was also suspicious and appeared to react to vague fears and ideas of persecution. He evidenced general psychomotor retardation, except when engaged in occupational work, at which times his reactions were more nearly normal. In general he was quite apathetic although on occasions he showed considerable affect in response to questions concerning the accident. There has been a trend toward progressive mental enfeeblement.

*Case XII.** The patient R. V., was twenty-seven years of age on admission to Walter Reed General Hospital, April 14, 1920. No psychopathic determinants were elicited in the family history. The patient had been considered a normal boy, had the usual diseases of childhood and was always having throat trouble until a tonsillectomy was performed in December, 1919. He attended a graded school and completed high school at the age of nineteen, and was occupied as a bookkeeper prior to his entry into the service. He was always bright,

* Used through the courtesy of Walter Reed General Hospital.

alert, a good mixer and had many friends among both sexes but was considered somewhat sensitive in his general make-up. He was easily disciplined and cooperative. He denied the use of alcoholic beverages and all venereal diseases. He was commissioned in the infantry June 5, 1917, and was married in March, 1918, before going overseas in May, 1918. He has one child.

While in action August 1, 1918, he was wounded by a high explosive shell penetrating the left temporoparietal region, through his helmet, producing a compound comminuted depressed fracture about $1 \times 1\frac{1}{2}$ inches with radiating lines about an inch outside and with many fragments driven into the brain. The patient was unconscious for a time following the injury. There was brain hernia, he had a tendency to a left conjugate deviation, a partial hemiplegia except for the face and had a right clonus and Babinski. He was operated on, under novocaine, a few days later, with removal of blood clot and bone fragments and incomplete closure. On August 10, the patient was described as conscious, not aphasic, but a little drowsy and sensibilities clouded. Pulse and respiration were normal. He had a right sided paralysis including the face although the latter was only partially affected. The right leg was spastic. There were no sensory changes, ocular palsies or hemianopsis. The right pupil was larger than the left, but both reacted to light and accommodation. There was a weak Babinski reaction on the right and the abdominal and cremasteric reflexes were weak on the right. The lesion was described as cortical, affecting the anterior Rolandic convolution superiorly, chiefly, although not exclusively. He remained in a hospital in France until transfer was effected to the States when he was transferred to Cape May, October 28, 1918, still suffering from brain hernia and a slight hemiplegia. A cranioplasty was performed January 30, 1919. He developed pneumonia of the right lung February 10, 1919, and subsequently a chronic suppurative pleurisy with sinus formation following primary costectomy of the right ninth rib which necessitated further operative procedures. From August 6 to 21, 1919, it was noted that he had attacks resembling Jacksonian epilepsy, a description of which was not available.

He was admitted to Walter Reed General Hospital in April, 1920, as an ambulatory patient, weighing 140 pounds. His general condition was poor. The respiratory status will not be given in detail except to note that there were pleuritic adhesions, definite diminution of the respiratory capacity and excursion of the right chest, with no definite tuberculous or parenchymatous involvement. The maximum degree of improvement for this condition was thought to have been attained. The circulatory, gastrointestinal, glandular and genitourinary systems appeared normal. A summary of the neurological examination showed no gross visual defects although cooperation in special tests could not be obtained. Both pupils reacted to light and accommodation, the left somewhat sluggishly to light and was somewhat vertically elongated. There was no nystagmus. The cranial nerves were otherwise normal. There was atrophy and weakness of the right extremities, with exaggeration of the deep tendon reflexes, a right ankle clonus and Babinski. The laboratory examina-

tions were negative, two Wassermann reactions of the blood serum were negative. X-ray examination of the skull showed a defect in the left parietal region near the cortex approximately 6 cm. in diameter with proliferation of bone tending to fill in the defect. There was slight depression of the bone at the upper edge of the parietal defect, probably causing some pressure on the brain. There was a small metallic body in the soft tissues outside of the skull near the lower portion of the defect.

Practically no mention was made of the patient's mental status in the records accompanying him to Walter Reed General Hospital but after admission and throughout his stay there, the following summary was made. He was hyperactive, violent and at times very destructive, requiring restraint. His stream of thought was disconnected and rambling, its content irrelevant and flighty. In the latter respect, he showed a marked flight of ideas. He was quite distractible, talked at random, saying many foolish and childish things. His general reactions were childish. Emotionally, he was easily disturbed, at times laughing and playful, at other times crying, abusive, excitable and violent as well as destructive. His attitude was evasive, inattentive and inaccessible. It was very difficult for him to concentrate. He denied delusions and hallucinations but reacted to both. For example, the following, under date of April 3, 1920, just prior to his admission to Walter Reed Hospital and signed by the patient, is submitted:

"To be read to my class.

There are those among you who have begun to doubt me!

You are right and you are wrong.

My physical handicap is at once a detriment and at once an asset.

If you will bear with me long enough I can show you where any institution not counting the C—— Institute of Technology, is based on the wrong philanthropic basis.

All I can say, however, right now is *use your eyes.*

All I can say, however, right now is *use your ears.*

All I can say, however, right now is *use your finger tips.*

Now I have one favor to ask, return me my 'New Testament.'

When that is received, I stand ready to argue with Elihu Root or any other great lawyer, but always on paper.

If I die a natural death, the world is dead and life insurance or anything else is a failure.

If I sell this policy, I shall never *want* to sell another.

Single Premium \$10,000,000.00 (ten million). This premium would be shared by so many companies the loss would be small per company.

I appoint L—— as my go between.

Yours very truly,

P. S.—1. Any questions to be asked on these statements, please hand to Dr. ——.

2. I would prefer not to be asked questions on the street or gaped at like a side show."

He was disoriented in all spheres, had no insight into his condition and his judgment was faulty. His memory was quite poor for past and recent events although at times it was possible to get him to discuss events of the past year or two in a fairly rational manner. On account of his refusal to cooperate, special tests were not performed. His actions at times were quite filthy, he spat upon the wall or corpsmen, did not keep his clothes on and threw his meals, or anything he got his hands upon, around the ward. He frequently attacked other patients and the corpsmen without provocation. He was discharged in the later part of the summer of 1920 at the request of his relatives with a mental diagnosis of traumatic psychosis. Information was obtained from unofficial sources to the effect that after discharge from the hospital this patient immediately began to improve mentally and has been making a good adjustment since that time.

As noted, the above patient was described as having had a "sensitive makeup." In other respects, we find nothing unusual in the previous history. Following a compound comminuted depressed fracture of the left temporal and parietal bones, he was, for a time, unconscious. Subsequently, he was drowsy and his perceptions were blunted. He had hernia cerebri and a right hemiplegia with ankle clonus and Babinski. While convalescing, six months later, he developed a pneumonia, and, as a sequel to this, a chronic suppurative pleurisy on the right, which necessitated several operations. Again, a year after the head injury he had, for a period of two weeks, attacks resembling "Jacksonian" epilepsy. The available records make no mention of the patient's mental status during the eighteen months immediately subsequent to the injury. It was then noted that he was hyperactive, violent and destructive. His speech was irrelevant, disconnected, rambling and childish and he evidenced a flight of ideas with distractibility. He was emotionally unstable, and his attitude was evasive, inaccessible and noncooperative. He denied hallucinations and delusions but appeared to react to both. He was lacking in insight and judgment, was grossly disoriented and evidenced memory impairment. In habits he was filthy and untidy. Several months later, following discharge against medical advice, he made an almost immediate recovery. It has been learned that he has made a satisfactory adjustment since his discharge. That the later mental manifestations, in this case, were functional and relatively accidental seems obvious.

Case XIII. The patient H. C., was born October 25, 1891, in Ohio. The father was reported as sixty-four years of age. He has suffered from rheumatism. He has moved from place to place, apparently living wherever he could secure work. The mother was about fifty-three years of age; her vision markedly impaired, due to cataracts. She has had seven children, five of whom were living—one son by a former marriage, the second child (the patient), two other sons and one daughter. One daughter died at the age of two months from pneumonia and one boy died at the age of five months from some spinal disease. The mother's health was considered good

before, and after, the patient's birth. No instruments were used but labor was described as difficult. The patient was considered a healthy baby. The history obtained from both the father and the patient has been conflicting and unreliable. That obtained by the social welfare visitors may be relied upon, although somewhat meagre. He had the usual children's diseases,—mumps, whooping cough, chicken pox and measles. Attended school from the age of seven to fifteen, being then in the seventh grade. He had some trouble with his teacher and did not return to school but went to work for a neighboring farmer. He worked at numerous "jobs", farming, hauling coal, digging cellars and all kinds of common labor. He apparently did not remain in one position for any length of time. The social welfare visitor described the home as very distasteful, the interior being not only untidy but dirty in appearance. She was impressed by the fact that the whole family appeared to be somewhat defective mentally. No record was obtained of the patient having had any conflicts with the civilian or military authorities or of the use of alcohol or drugs. The patient denied having committed any perverse sexual acts or having had any abnormal sexual cravings. He was quite evasive concerning the sexual subject but from repeated questioning, it seemed obvious that he had not made a satisfactory heterosexual adjustment. The patient claimed to have worked in a stone quarry during the summer months for four years, earning from \$2.50 to \$3.50 per day. Stated that he worked in a jewelry store for awhile, a blacksmith shop for two months, ran a butcher shop, a restaurant and pool room, worked for several coal companies driving automobiles and taking care of the horses, and stated that he was manager of a large lumber concern for a long time. At other times he has stated that he had always worked on a farm, had been a locomotive engineer, a lawyer or a doctor. He was drafted into the army June 25, 1918, and was discharged at Camp Dix as a corporal January 27, 1919. He was married three days later. He was then employed as a guard and watchman in a government munition factory in Morgan, N. J.

While at work April 4, 1919, he was thrown from his horse and was taken to the Perth Amboy City Hospital, where his wife was told that he had concussion of the brain. Following his injury he was unconscious for about a week. He then appeared delirious, screamed, shouted and talked in an obscene manner which was entirely unusual with him. He never recognized his wife at the Perth Amboy Hospital during his three weeks' residence there, but at the Marine Hospital, Staten Island, he gradually began to recognize her when she visited him. He was quite disoriented spatially at that time, thinking that he was in a boarding house. His memory was also impaired and he talked in a very disconnected and incoherent manner. An X-ray examination of his head showed no signs of fracture. He was transferred to Bellevue Hospital. At the psychopathic pavilion he was described as excited, confused and destructive. He showed a marked memory impairment, misidentified those about him, calling them "teacher," and so on. He said that he was fourteen years

old but marked up to sixteen. He was disoriented for time, place and personal relations.

Upon admission to the Manhattan State Hospital, May 6, 1919, the physical examination revealed unequal pupils, the right was larger than the left, irregular in contour, but both reacted well to light and accommodation. The left patellar reflex appeared absent and the right was diminished. The knee jerks were later normal and equal. Serological examination of the spinal fluid showed a positive globulin, twenty-six cells and the Wassermann reaction was plus minus. He was well behaved and cleanly and attempted to take up some work about the ward but was not very efficient in applying himself. He was sociable toward the other patients but appeared to be confused. His replies to questions were coherent but often quite irrelevant. He showed some tendency to rambling volubility. Emotionally, he was quiescent and he denied any special depression. He claimed in a rather superficial way that he had auditory hallucinations of a threatening character of only one or two days' duration. However, he denied any general persecutory ideas. There was a tendency to spontaneous fabrication and he was almost entirely amnesic for events leading to his commitment. He was grossly disoriented in the various fields, he finally hazarded a guess that it was February but was totally unable to tell the year. He thought that he was still in the state of Ohio and had no clear idea of his environment. His memory for the immediate past was markedly impaired, stating that he thought he had been in the hospital three or four days when in reality he had been in the hospital a month. He thought that his uncle had brought him to the hospital from some town in Ohio. He filled in the amnesic gaps with fabrications, stating quite glibly that he had been working on a farm in Ohio a week ago. He had a profound amnesia, anterograde and retrograde, the latter dating back to the time he left the farm in Ohio until he found himself in the hospital. He claimed that he had always worked on a farm in Ohio until four or five days prior to his admission to the Manhattan State Hospital, when his father took him some place and he was then brought there. He even fabricated his journey to the hospital on a railway train. When asked if he was in the army, he replied that he was in the army for four or five days and then went home. He showed numerous date discrepancies of which he was entirely unaware. For example, he said he was born in 1900, twenty-nine years ago. His retentive powers were also impaired, failing on three out of the four tests given to him a few minutes later. His grasp on general information and school knowledge was also impaired. Insight was entirely lacking and his judgment was defective. He was transferred as unimproved to the U. S. Public Health Service Hospital No. 28 at Dansville, New York, July 5, 1919, with a diagnosis of "Traumatic Psychosis—Post-Traumatic Delirium."

On admission to the hospital at Dansville, his condition remained practically the same. He was pleasant and agreeable, showed an occasional flight of ideas, was talkative, elated and good-natured. No delusions or hallucinations were elicited and he was oriented as to time but not as to place. He knew that he had been at the hospital

one day. In August, the patient talked a great deal about going home to look after some private affairs and to take care of his wife. He said that he was willing to pay money in order that he might be allowed to go and he would also agree to return. He claimed that his bad memory was due to worry about his wife. He stated that he would be willing to work for a whole year if anyone wanted him to take charge of a bunch of men. His wife would then be there, and under such conditions he believed his memory would return and everything would be all right. He said that he could operate any kind of an engine, locomotive or airplane. Later when his wife visited him, she was thought, by a number of people who observed her, to be rather queer in her speech and in her actions. She talked loudly and in a rather boastful way, while in the library, as though she were trying to impress the other patients with her importance. She laughed in a loud and silly manner. To the secretary of the K. of C. she told a tale of woe which resulted in his getting one of his friends to put up a nice lunch for her. At the railway station she met a couple of friends with whom she was quite hilarious.

Later, in September, it was noted that the patient was the center of interest in the barber shop. The other patients were greatly amused by his answers to the questions asked of him in jest. He was very boastful and childish in his remarks. He admitted considerable knowledge of airplanes and the manner of operating them. When asked by the physician as to where he had ever been in an airplane, he said, "Oh, just up and down." He frequently told great tales of his powers, never realizing that others were joking with him. In conversation with several other patients on the ward, he admitted that President Wilson was a great friend of his and that he frequently came to visit him, flying from Washington to this place in an airplane. When the President arrived in Dansville, he perched on a tree outside of the hospital and waited for the patient to come out and visit with him. He claimed to have met the President seven years ago in Colorado. At that time, Mr. Wilson was running a garage. He became so grandiose concerning his abilities that a spinal fluid examination was made. The results, the colloidal gold, globulin and Wassermann were negative. The cell count was five. When questioned about the accident, he claimed to remember it, denied having ever been unconscious, in fact, he believed that when thrown, he arose and pursued the horse in an attempt to catch it. About this time, he began to be fault-finding in the letters that he wrote his father, so much so, that the father became quite excited and threatened to send an officer to investigate his son's case. The patient also showed resentment concerning certain rules of the hospital which he had broken in December. A Wassermann of the blood serum was reported negative January 1, 1920. In February, the wife talked at length with the physician about getting a divorce if her husband's improvement was likely to be slow. During the remainder of his residence at Dansville, his mental condition remained practically unchanged. He was orderly but restless and easily excitable, making complaints about being held in the hospital, about having his things stolen and about his wife's neglect of him. He continued to

be grandiose and boastful, reciting his list of accomplishments in a sort of a ritual. He was transferred to St. Elizabeths Hospital, Washington, D. C., arriving here August 31, 1920.

Since admission to this hospital the patient has shown practically the same symptomatology. He, however, gradually became more paranoid and frequently addressed the physicians, demanding that the ill treatment which he was receiving be discontinued. He believed that he was being treated in an inhuman manner by the attendants. The authorities of various hospitals had it in for him and he was not getting his War Risk Insurance because they stole his card. He said they lied about him and kept him locked up when the reason for his admission, a broken head, had long since disappeared. At no time, however, has he shown any reaction to the delusionary ideas which he expressed. He continued grandiose and bragged of his mechanical ability. He was neat and tidy in his general appearance and was pleasant and coöperative. He has done some work in the agricultural class and of late has been working quite steadily in the automobile shop where he has gotten along quite well. He was oriented in all spheres and showed considerable emotional and intellectual deterioration. He has not had the slightest insight and his judgment has remained markedly defective. His physical condition has been good.

The psychopathic character of this patient seems obvious. The concussion induced a state of unconsciousness of a week's duration, following which he was described as delirious. For several weeks he talked in a rambling irrelevant manner, was confused, misidentified those about him and was grossly disoriented. There was a retrograde amnesia of several years. Two months after the injury he thought that he had only been in the hospital for a few days. He strove to fill the amnesic gap by spontaneous fabrication. He had no appreciation of the situation, his judgment was faulty and his mental processes were enfeebled. There ensued a period of several months in which he was elated, boastful and entertained many delusions of self-importance; subsequently ideas of persecution appeared. Throughout the course of his illness, he has evidenced irritability, emotional and intellectual impairment. No doubt there has been a change in his personality; a change, moreover, which is related in time to that of the accident. That the trauma constituted more than a precipitating element in the eruption of the psychotic manifestations is doubtful. Although the history is most scanty, we are safe in filling its gaps from the persistent elements contained in the psychosis. The pre-traumatic personality which this method presents is one from which the precox reaction might well ensue, regardless of the particular nature of the exciting event.

GENERAL SYMPTOMATOLOGY

To secure a composite descriptive picture of posttraumatic mental sequelae, one may postulate a young adult of normal physical and intellectual development, without hereditary taint, injurious addictions or inadequately assimilated complexes. This hypothetical individual

receives an injury to the cranium of severity such that a period of unconsciousness of a few days ensues. During this period, he is quite insensible to all external stimuli. He receives no impressions, therefore reacts to none and has no subjective experiences. Careful attention is given for indications necessitating operative intervention. A motor restlessness marks the slow transition from apychnia to a phase in which he reacts more and more to stimuli and to his environment. Later he may be aroused and responses obtained. Attention, however, is difficult to secure, much less to hold. His sensibilities remain blunted and he is hypersomnolent—the condition frequently described as semiconsciousness. With the appearance of restlessness, the patient requires restraining sheets to keep him in bed. His speech is muttering, slow and incoherent. He calls the female nurse in attendance “Bill” and asks her to do absurd things. There is a disorder of the perceptual field and he has no appreciation of the situation. As the purport of his talk becomes clearer, it is observed that he is reproducing certain aspects of his activities preceding the trauma. This may be called the occupational delirium. In the meanwhile, several days have elapsed for which he has a total amnesia; certain fragments from the later period of the delirium are reproduced in consciousness as dim recollections, are spoken of later as a dream. He now complains of a generalized headache and is dazed and confused as to his surroundings. He recalls events just prior to his injury in a general way but on account of his inability to associate ideas cannot explain his present condition. Any effort in association increases his perplexities and he takes refuge in his sleep. This retreat from reality is not entirely successful for the noxious stimuli remain and he continues restless and disturbed. On being aroused for his meals, he is grossly irritated and demands to know why he must continually be annoyed. He wishes to be alone and be allowed to sleep and be quiet. He suffers from hyperacusis and covers his head so that he can avoid hearing the harsh voice of the nurses and the other patients upon the ward, the rough steps in the corridor and the countless discordant sounds about him. He is moved into a private room where he is more contented, but the light hurts his eyes and the window must be darkened. With the window closed, the room seems to him hot and suffocating, and, with it opened, he chills. At times the summation of irritative stimuli is so great that he becomes quite excited. An explosive reaction, with accompanying vasomotor disturbances, ensues. His emotional instability is further manifested by the ease with which he can be cheered or depressed. He is now being allowed about the hospital

grounds. He is obviously weak, but feels that he is fully able to return to his work at once and makes frequent inquiry about his discharge. He is very rarely seen in association with the other patients. He may be found either in his room, a far corner of the convalescent quarters or in a quiet, shady nook upon the campus. When asked concerning his seclusiveness, he refers it to hyperacusis and the fact that he is easily annoyed. He states that he longs for companionship but is unable to enjoy it. In the ensuing months this irritability remains the dominant symptom. He complains of being unable to endure the heat of the sun, which causes headache and dizziness as does any unwonted exertion. He becomes profoundly intoxicated by a very small quantity of alcohol. He is unable to read for any length of time as his eyes hurt, his headache recurs and he becomes sleepy. His speech is slow and monotonous but entirely relevant and coherent. There is considerable emotional lability. He appears dull and lacks initiative although he speaks of resuming his former occupation. He has no hallucinations or delusions, but expresses some vague fear about his ability to care for himself in the future. Such ideas prevail when depressed or fatigued, mentally or physically. At other times he is quite confident and assured. He is now correctly oriented and remembers all events just prior to his injury. The amnesia extends for several days subsequent to his period of total unconsciousness. He exhibits some defect throughout the field of memory, being able to recall most remote and recent events, but having difficulty in correlating them in sequence or proper temporal relations. Careful investigation reveals that his intellectual impairment is more apparent than real and is due to a lack of interest rather than a defect.

In the ensuing months there is a gradual improvement, in that he becomes more sociable, more stable from an emotional standpoint and is not as easily fatigued or irritated. Following discharge from the hospital, he is unable to resume the more strenuous of his former activities. After a long rest at home, during which he begins to adjust moderately to his former social status, he secures a position similar to that formerly held, but one requiring less responsibility, less mental and physical exertion and situated in a more peaceful and quiet environment. Here, he adjusts quite well but there has been in some measure a definite and permanent change in his personality.

The final outcome in actual cases, of course, depends upon the severity, type and location of the injury. The location of the lesion or the point of injury has been purposely avoided in grouping the mental symptoms. Almost any conceivable neurological condition

may be presented, and where graver defects coexist, permanent invalidism may ensue; even progressive mental enfeeblement may be observed.

INTERPRETATION OF SYMPTOMS

It has been mentioned that the inability of a patient to appreciate the seriousness of his condition, the lack of a feeling of illness, was diagnostic of the mental disturbance after severe concussion of the brain in contradistinction to instances of malingering where complaints were very emphatic. Where there is no insight, the appearance of an euphoria does not seem extraordinary. It is quite in keeping with the situation as appreciated. In regard to the vague depression and vague anticipatory fears as to the future, one may assume either that these represent the expression of some slight measure of appreciation of the situation or that they are instances of general emotional disorder. The conspicuous emotional instability which may follow brain trauma is no more simply to be accounted for than is emotional instability in general. Factors which may assume etiologic importance in this condition are discussed hereinafter, but the ambitious task of interpreting the larger subject must await upon the results of further investigation. Again, the amnesias will not be discussed at length. However, a retrograde amnesia of a few minutes depending upon the pretraumatic situation appears understandable; an anterograde amnesia, during the period necessary for the individual to make an adjustment to conscious perception of the environment, seems quite plausible. Certain ocular manifestations,—neuritis of the disc, irregular contraction of the visual fields, scotomata, muscle imbalance and paralyses, frequently occur and play considerable rôles in certain of the patient's difficulties. As to other changes especially relating to nerve tissue which are induced by trauma to the cranium, it may briefly be stated that the violent compression, shaking and crushing result in a very considerable alteration in the vital colloid of the neuron system. If the violence is of sufficient intensity one observes, as a related phenomenon, the complete interruption of consciousness. During the period of profound coma there is a complete retraction of the field of consciousness and the organism is impermeable to all external stimuli. Unconsciousness may be conceived as a defense for the preservation of the organism. As consciousness slowly is reëstablished the development of a massive defense reaction for securing that inactivity necessary for repair processes becomes evident in the form of a striking exaltation of the normal irritability of the nervous tissue. All the mental symptoms attributable to the trauma may be interpreted from a com-

mon basis found in this hyperirritability. During the period of conscious readjustment, the sensorium is flooded by countless afferent impulses, to the intensity of which the organism in its normal state of irritability is quite unaccustomed. These impulses are of acoustic, optic, dermal, thermal and somatic origin. The hyperirritability appears to be at its maximum during this phase and the summation of stimuli produces the symptom of restlessness. The patient may cover up his head, may be "curled up" in bed and extremely excitable. The summation may be so great as to induce an explosive reaction with its accompanying vasomotor disturbances. The seclusiveness shown by the patient after he is allowed out of bed is a reaction to avoid noxious stimuli in his environment. He suffers chiefly from hyperacusis and seeks a quiet nook where he may shut himself completely out of the environment. In no other way can he satisfactorily reestablish a measure of his former sense of well being. This seclusiveness and apparent lack of interest is necessary withdrawal into a limited world of his own where painful stimuli are reduced to a minimum and precludes a normal interest in his environment. Under such circumstances considerable perceptual disturbances ensue. One may include here a note concerning the lethargy or excessive sleep indulged in by these patients. Where sleep can be secured it may be persisted in for some time. A patient may be described as drowsy or somnolent for weeks or months. One patient, over two years following his injury, stated that he became drowsy after any momentary excitement. Such sleep might be considered from the viewpoint of a "reaction to stimuli" or a "flight from reality." As a result of the influx of sensations, due to the hyperirritability of the peripheral sensory apparatus, there is considerable distractibility present. There is a defect in the patient's power of concentration because, hitherto, attention has had no experience in avoiding such a mass of unusually acute sensations. There is a broadening of the field of consciousness with undue prominence given to the endogenous stimuli and a relative handicap of the "distance receptors." This accounts for the enfeeblement of voluntary attention, the "mental fatigability" and the difficulty found in securing proper association of ideas. Further there is relatively fragmentary thinking in that the distracting perceptions erupt constantly into the existing state of consciousness. It is only from this larger viewpoint that we can comprehend another of the most striking difficulties of the posttraumatic patient. There seems to be an universally exaggerated susceptibility to ethyl alcohol. The inhibiting and dissociative effect of this toxin in the perceptual and cognitive field is unduly conspicuous and its enfeebling effect on motor coördination greatly enhanced.

ADVENTITIOUS PHENOMENA

In the individual possessed of pretraumatic psychopathic traits of character, the posttraumatic picture may be greatly colored or quite completely altered. This depends upon, and varies according to, the personality trends. Certain psychic phenomena may be mentioned which, having occurred subsequent to head injuries, have been ascribed to trauma. Their relation to psychogenesis seems fairly obvious, even though there seems no good reason for denying the injury as the exciting or accentuating factor. In fact, in the great majority, if not in all of the so-called traumatic neuroses, an analysis would reveal definite wish fulfillment. Following traumatism there has been observed a protracted delirium with confabulations, with or without an alcoholic or senile basis. Retrospective falsification of memory, a tendency to fill in the amnesic gap with spontaneous fabrications, and long periods of retrograde and anterograde amnesias are not uncommon. Again, there may be observed hysteriform attacks, psychic epilepsy, and paranoid trends, as well as the precox and manic-depressive mechanisms in general. For the modern psychiatrist, these psychotic phenomena need no specific basis in organic changes following upon the traumatism.

SUMMARY

The interesting feature, in the cases chosen for presentation, is the absence of psychotic or neurotic manifestations, excepting when strong prior taint was indicated; this too, where severe injury had been sustained. This fact justifies one in reviewing the prevailing nosological terms, such as, "Posttraumatic Neurasthenia," "Posttraumatic Psychopathic Personality" and "Posttraumatic Constitution." Furthermore, it may well be noted that it is upon the prominence of a particular condition that the vasomotor symptom complex of Friedman and the "Explosive Diathesis" of Kaplan have been based. The lethargy, with the ocular and various other neurological phenomena present, has oftentimes been noted as producing a condition not easily distinguishable from certain types of Epidemic or Lethargic Encephalitis. In this connection, the term "Traumatic Encephalitis" has been used.

In the classification of any mental disorder precipitated by trauma, it is suggested that due consideration be accorded to the mechanism involved; *e.g.*, the precox mechanism. In those conditions directly attributable to a head injury, the terms,—"Concussion Syndrome," "Posttraumatic Constitution" and "Traumatic Defect Condition" seem peculiarly applicable. The terms of this classifica-

tion are derived from those of Adolf Meyer; the changes in his 1904 classification are those which have grown out of the vast material of the war on the one hand and the extension of the principles of the newer psychiatry on the other.

I. CONCUSSION SYNDROME

With or without febrile or deliriod reaction and characterized by a varying period of unconsciousness, clouding of the perceptual field and motor restlessness—the reaction to the various stimuli flooding the sensorium.

II. POSTTRAUMATIC CONSTITUTION

The defense phenomena with the dependent condition of hyper-irritability.

III. TRAUMATIC DEFECT CONDITION

Dependent upon the location of the lesion, aphasias, paralyses, and secondary mental deterioration, with or without arteriosclerosis. Types to be specified.

The value of social service methods may be emphasized in the compilation of a reliable anamnesis. Where an adequate conception and appreciation is sought, considerable depends upon the information obtained concerning the patient's previous history. This is true, especially, in regard to changes in the personality and efficiency of the individual, where skillful psychotherapy may prove of incalculable value in the prevention of profoundly deleterious alterations sequent upon unresolved conflicts and unassimilated psychic material which assume dominant rôles as results of the disorder and interruption of the adjustment of the individual. It is unfortunate that more exhaustive description of the earlier mental manifestations cannot generally be secured in cases of this kind. While the surgeon has very little time for the correlation of such phenomena, a plea is made that greater attention be paid and more exhaustive notes taken on what is clearly an interesting problem. It is surprising what excellent graphic description may be drawn by an attending nurse, who has had a few simple instructions. This, with the psychiatrist's observations, become of much value later in understanding the patient's particular problem and working out rational psychotherapy for him. The patient may gain considerable insight into his difficulties and be enabled to make a more satisfactory adjustment. Where psychogenic factors assume a deleterious influence, psychoanalysis seems to be the rational method of approach.

CONCLUSION

There is no clinical entity which may properly be called a traumatic psychosis or neurosis. However, there has been found, following severe injury to the brain, an alteration in the personality, which may be described as the "Posttraumatic Constitution."

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PSYCHOSIS WITH ENCEPHALITIS AND CEREBRO-SPINAL FLUID FINDINGS

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Catherine M., admitted to the Chicago State Hospital 4-9-21. The history as given by her husband is as follows:

Patinet was born in Hungary; thirty-seven years of age, married and has three healthy children. There was nothing unusual in her life until January 26, 1921. When her husband returned from work on that evening she complained of a headache and stated that the reason for it was that her husband had given her poison. Patient then stated that she was hypnotized; that ghosts were walking in the house; then accused her husband of going about with other women. She could not sleep and on February 19th was taken to the County Hospital, where she slept for ten days, and the husband was informed that she had developed a sleeping sickness.

Three weeks after she was taken to the County Hospital, the doctors told the husband that patient was suffering from scarlet fever. When she recovered, she was taken to the Psychopathic Hospital. The County Social Service reports as follows: Patient entered 2-19-21 on ward 62 and diagnosed epidemic encephalitis, lethargic type, sore throat and desquamation beginning several days later. Patient was then transferred to the Contagious Hospital where convalescence has been characterized by marked lethargy, occasional negativistic manifestations and some signs of catatonia. Emotional indifference is marked.—Kalish, M.D.

Husband states that on January 26, patient was taken with sleeping sickness. Slept at irregular intervals and when awake she talked irrationally. The Psychopathic Hospital diagnosed her as a case of organic brain disease, post encephalitis lethargica. Physical: negative at present. Mental: patient has not spoken a word since admission other than to tell her name. Lies in bed smiling to herself in reaction to visual hallucinations. When asked if God talks to her, she smiles and nods in the affirmative.

When admitted to the Chicago State Hospital the patient was in bed the first week in a more or less stuporous condition. However, she took nourishment when it was brought to her. After week's stay in bed she commenced to take interest in the activities of the ward. Finally she was given her clothing and dressed. After this she was up and about and took some interest in occupational therapy. The people who came to visit her stated that she talked quite sensibly, although she did not speak much to the other patients and the nurses. After being up for a week or two she developed another stuporous

spell during which she would lie in bed and pay no attention to her surroundings, but took nourishment well. The mental examination was made while she was somewhat clear and with the aid of a Bohemian interpreter the following was obtained:

Patient gave her name as Frances Potera. When asked the identity of the man, Paul M. (her husband) who came to see her, she stated that he was her first husband. She was asked the name of the place, and she laughed and said she did not know the kind of a place it is. Finally, afterward she stated that it is a State Hospital. When asked the date she stated that she did not know, but knew that it was spring. She knew when she came and how long she had been in the Chicago State Hospital. Patient also knew that previous to coming here she was at the County Hospital. Said she came out on a car and was carried in the hospital by men. (Patient was admitted as a stretcher case.) When asked why she came to the Chicago State Hospital, patient stated that she came because she was not well and the doctor knew better than she just what was wrong with her. Says nothing hurts her now. Asked whether there is anything wrong with her mind she laughs and says there is nothing wrong with her mind. States, however, that she hears voices but cannot tell everything they say to her. It is too much for her. They call her names. She knows whose voices they are, but refuses to tell; then she states that God talks to her and Jesus Christ talks to her but she does not know what they are saying. Says she knows of no one who wants to harm her.

Her personal identification was well given. She stated that she was born in Europe; did not know the year but knew that she was thirty-seven years old. Has had five years schooling and had been in the United States twenty years. Had been married seventeen years. Her husband's name is Paul M. She has three children, ages sixteen, fourteen and eleven years. Showed no emotion when speaking of her children. When asked who was taking care of her children while she was in the Hospital, patient stated that she did not know.

In the general knowledge tests patient could name the President, but not the Governor or Mayor. Could not name the previous ruler of Austria-Hungary, but did name the capital cities of the United States and Bohemia. Patient knew nothing about the recent war. She could not give the definition between a king and a president.

Her calculation was also poor. Patient was unable to give 6×6 , but she did return 4×4 , 6 plus 7 and 25 minus 6 correctly. Her retention was good. She returned correctly Irving 178 after five minutes.

Patient's physical examination was entirely negative. Laboratory examinations on blood and urine were negative. Spinal fluid done on April 11, 1921, gave 34 cells, Ross Jones minus, Pandy one plus, Lange's Gold 0002100000, and on April 21 the fluid gave 9 cells, Ross Jones minus, Pandy one plus and Lange's Gold 0001100000. Macrophages were present in the spinal fluid.

Course of the Disease: This patient was an inmate of the

Chicago State Hospital from April 9, 1921, to November 21, 1921, at which time she was paroled to her husband. Notes taken from time to time during her stay in the hospital state that she was in good physical condition, but indifferent. She would sit by herself and would not communicate with other patients. Was clean in her habits. Patient took some interest in the Occupational Therapy Class and would occasionally answer the questions of her physician.

Social Service notes taken at the home of patient while she was on parole state that she took good care of her home but was mute; refused to talk to anyone nor would she answer the questions of the Social Service physician, but stared at the floor with a rather superficial smile on her face all the time the physician was questioning her.

The interesting features in this case are that the mental symptoms resembling dementia praecox, such as accusing her husband of giving her poison, being hypnotized, hearing noises of ghosts walking in her room, and her husband being untrue to her have developed during the prodromal state and that three months afterward she admitted hearing voices, showing a split of consciousness by claiming that her name was Frances Potera and denying that her husband was her husband; and that more than a year after the onset of the encephalitis (the last note was taken March 22) she was still declining to talk, except when her husband scolded the children, she would uphold them; indifferent to her surroundings and seclusive. The association of scarlet fever with the encephalitis and the finding of macrophages in the cerebrospinal fluid.

I believe that in a careful examination of the cerebrospinal fluid a good deal more information could be obtained in nervous and mental diseases than we possess today. A careful study of the cells with a good stain like the picric acid and benzidin stain that I have reported in the *Medical Record*, November 6, 1915, considerable information about brain pathology can be had. In all acute inflammation of the meninges, like cerebrospinal meningitis, the polymorphous leucocytes predominate which can be distinguished by their protoplasm staining poorly, and their nucleus are stained yellow. Endothelial cells are also found which are distinguished by being flat cells and stained blue; the nucleus a deep blue white the protoplasm is a light blue.

In chronic inflammation of the meninges like tuberculous or syphilitic meningitis, the lymphocytes predominate and are distinguished by the protoplasm not staining at all, and the nucleus is stained yellow with a clockdial-like arrangement.

In general paralysis of the insane, we find the lymphocytes predominating, but we also find occasionally the polymorphy varieties,

red cells which stain uniform blue or not at all; plasma cells whose nuclei stain deeper and are always eccentric.

A cell which resembles the plasma cell except the protoplasm stains a light blue and the nucleus a deep blue, I have designated as a transitional cell. Endothelial cells and macrophages cells which are found in all inflammations of the brain are large cells and are stained partly blue and partly yellow; by a careful study, it is found that the cell itself stains yellow and the blue is due to particles the cell has taken up. The nucleus is more or less eccentric. In shape they may be round or elongated. In some cells the nucleus is located at one end and at the other end the protoplasm is drawn out to a point and resembles a pin which has been flattened and stained yellow.

They unquestionably have their origin in the neuroglia cells. In response to destruction of brain substances, they pick up the destroyed substances, enter the perivascular lymph spaces in the blood vessels and reach the subarachnoid space where they discharge the substances. They then elongate like a pin, pierce the arachnoid and pia by an ameboid movement, again reach the brain and pick up destroyed brain substances to carry them through the lymph spaces in the blood vessels and discharge again in the subarachnoid space. In this way they are capable of removing considerable waste material from the brain.

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MEETING, MAY 18, 1922

DR. F. H. PACKARD, PRESIDENT, in the Chair

THE RELATION OF FEEBLEMINDEDNESS TO A CRIMINAL CAREER

Dr. A. W. Stearns presented the histories of four men for the purpose of raising the question of the relation of feeble-mindedness to a criminal career rather than of answering it. These four men were standing on a street corner and at the suggestion of one of the men they stole an automobile and started driving about. They were stopped by a policeman and one of the men shot the policeman. They were all convicted of assault with intent to kill and given from seven to nine years in States Prison.

The first man, Y., was twenty years old, born in New Brunswick, came to the United States and grew up in Somerville. He remained in school until he was twelve, reaching the second grade. He had more or less trouble of a minor nature with the police and truant officer. At that time he was accused of burglary and sent to the Lyman School. He left there after a short time and was arrested four times for burglary, larceny, disorderly conduct, attempted larceny. He was sent back to the Lyman School, ran away after nine months, was committed to the School for the Feeble-minded at Waverley where his mental age was said to be eight years and he was called definitely feeble-minded. In 1918 he was again at large, was arrested for burglary and served eight months at the Concord Reformatory. Shortly after leaving there he became a member of this group. While at Concord he became acquainted with D. and M., two members of the party, and the fourth member he had known as a boy and had been his associate for a number of years.

The second member, C., nineteen years of age, born in Massachusetts, had lived in Somerville for a good many years. He reached the seventh grade in school, and had worked for two years as a clerk in a store. In 1914 he was arrested for disturbing the peace, 1915 for larceny, 1917 for larceny when he was sent to Shirley for a short while, later he was arrested and sent back there where he spent eleven months. In 1919 he was arrested for stealing an automobile on two occasions and sent for a year to Concord Reformatory. At Concord his mental age was found to be 9.4 and he was classified as not

feebleminded. While at Concord he became acquainted with D. and Y. When at Shirley he became a friend of M.

M., the third man, was born in Cambridge and went a year and a half to High School. He did well and was not troublesome until he was sixteen years of age. At that time he was arrested for stealing an automobile, was sentenced, but the sentence was suspended. In 1918 he was again arrested for stealing an automobile, sentenced to Shirley, the case was appealed. In 1919 he was arrested on three counts for stealing automobiles and again the case was filed. He was again arrested on the same charge and was sent to Shirley where he became acquainted with C. In 1919 he went to Concord Reformatory where he spent $8\frac{3}{4}$ months. His intellectual level was sixteen, his intelligence quotient one. He was classified as a responsible offender.

D., the fourth, was born in New Brunswick and came to this country when he was six weeks old. He grew up in Somerville, went two years to High School and did well, but had trouble previous to that. In 1912 he was arrested for larceny, 1915 for assault and battery, 1916 for breaking and entering, 1918 for drunkenness, 1918 for larceny and was sent to Shirley where he spent ten weeks and became acquainted with C. In 1919 he was again arrested for stealing goods and sent to Massachusetts Reformatory where he became acquainted with M. and Y.

Of these four individuals one was definitely feebleminded, one on the ragged edge, according to the scale feebleminded, but Dr. Fernald's opinion was that he was a border-line case, and two were not feebleminded, but according to the tests a trifle superior. The two superior ones had good homes, Y. had a broken home and he had grown up on the street. C. had an unsatisfactory home and a drinking father.

When studies were made of prison populations a few years ago and a considerable percentage were found to be feebleminded we all felt that a great advance had been made in the study of criminology, but I find myself less and less satisfied with feeblemindedness as a sole cause of criminality. These four individuals had almost identical careers. Is it fair to say that because one is feebleminded that his career is explained or should we search farther? This particular gang had been organized on the basis of common experience. Making a combination of hedonism and the gregarious instinct and judging individuals by elements of conduct on the basis of a very strong tendency to conform to the customs and habits and conduct of associates, is there not a stronger argument in favor of other factors determining the criminality in these cases than the feeblemindedness? A short while ago it was found that of a certain prison population 28 per cent were left-handed and that fact could be used as an argument that left-handedness was a cause of a criminal career. The group in question is a typical one. It is common to have from three to half a dozen young men arrested for the same offense show-

ing all degrees of intellectual attainment. In States Prison about 20 per cent are men born in Italy who are convicted of second degree murder. One case in particular is that of a man who was sitting about a card table with other men. They had had a drink or two, a quarrel began and he was expected to fight. He pled with his associates on the basis that he had a family and he didn't want to fight, but by public opinion he was forced to; he killed his adversary and was given a life sentence. He had conformed to the standards of his social station. Is it not fair to assume that the imbecile's career is at least as much dependent upon his associates and upon his experience as upon his intellectual inferiority? The pressure to a criminal career is felt out of proportion by the feeble-minded, yet feeble-mindedness in itself is not an adequate and complete explanation of a criminal career. The elements in a criminal career must be looked for quite beyond feeble-mindedness and they may be found in sociological study oftentimes as much as in psychiatric study.

Discussion—Dr. F. L. Wells said that the situation in regard to psychometric findings in delinquent cases is not necessarily one of defective intelligence. As in the psychotic cases a lowering of the intelligence level may be found, but at the same time many cases are at and above the normal average. Some interesting studies have been made by Murchison of the college graduate as an inmate of penitentiaries. His work was done in Ohio and he found that the proportion of college graduates in prison was somewhat larger than college graduates in the general population of the state.

Dr. Edward B. Lane said one difficulty in discussing this subject is that feeble-mindedness is often described as an entity. It is not an entity. It is recognizing in certain persons a defect and these defects are various. The majority of feeble-minded persons are not criminal in their tendencies. A few years ago the social workers ran off at a tangent and sought to prove that every immoral woman was feeble-minded. A certain school teacher who had chosen to lead an easy life was kept under watch for a year as a feeble-minded person, but after careful examination I could find no reason for considering her as such. There is no reason to presume that because a person is feeble-minded she is immoral or vice versa. But the practical question is that society has to be protected. It is the business of courts and of the doctors to help them when these persistent offenders come up to consider the protection of society. We used to hear of moral imbecility. The term is not used often now, but it describes the condition of people who all their lives until sixty years or more can never control their selfish desires and will never allow consideration of the rights of others to restrain them. A speaker has mentioned the knowledge of right and wrong test—these defectives are very keen to detect any attack upon their own rights and make loud protests of the wrong done them.

Dr. J. A. Houston said that the majority of cases of repeated offenders that are being examined now in the courts, although perhaps

not intellectually feeble-minded, do show a marked defect. They can be picked out as being a little peculiar and different. They are defective in many ways, they are deficient in judgment, defective in their sociological and moral sense. They have no regard for the rights of others, are selfish and not amenable to fear of punishment nor susceptible to the rewards of well-doing. There is a defect, though it be not a defect of intellect. In this connection he spoke of the desirability of the state's taking control of the care of its defectives. He believed that the care of the criminal class should be taken out of county control. The state can take care of them to better advantage. Dr. Stearns has spoken of the four men under discussion becoming acquainted with each other in three different institutions. In the county jails there is too much opportunity for criminals to associate with each other while awaiting trial. The last group which he examined had become acquainted with each other at the state prison where they had met a third person who was there for breaking and entering, who told them the circumstances of his burglary. Prior to the release of the three they had formed a plan and when they were free they carried it out and broke into two stores. They were arrested and while awaiting trial they were associated with eight or ten others in jail where they had nothing to do to occupy their time except to read, play games, tell stories and recount their experiences. These men had arranged their stories to be told at their coming trial so that they would all agree. It would seem that the state might handle such cases more rationally than is being done by the counties.

Dr. Karl Bowman said there are a great many criminal cases referred to the Boston Psychopathic Hospital and our experience shows definitely that a large per cent of these cases are not feeble-minded. Feeble-mindedness is not the real basis of criminality. Our examination of such cases has not helped us to understand why these individuals are criminal. We do not know why they are, we can simply say that they have taken up a certain way of acting. There is an article by Dr. Tredgold in the last number of the *Journal of Neurology and Psychopathology* in which he endeavors to explain this condition as an arrest of development. It is too involved to more than mention, but it has some very helpful ideas. One reason why the feeble-minded person tends to become criminal is emphasized by Dr. Goddard in his latest book. An individual of less than twelve years is unable to grasp abstract ideas and therefore the inculcating of abstract ideas of justice, honesty, etc., cannot be successfully accomplished by ordinary methods. He considers the present school system at fault in its teaching of morality since teaching on that abstract basis cannot bring about the desired result.

Dr. Stearns (in closing). Judging from these four cases it seems highly improper to me to use a criminal career as an important factor in differential diagnosis as is so frequently done. The social conduct is given too important a place in the diagnosis of feeble-mindedness.

THE CIRCULATION OF PHENOL SULPHOTHALEIN IN THE CEREBROSPINAL FLUID

Dr. H. C. Solomon read this paper.

Discussion—Dr. J. B. Ayer. Dr. Solomon's work is of extreme value. It might be pointed out that in making these experiments with a glass tube representing the spinal canal, it is impossible to reproduce in the tube the pulse oscillations and the respiratory excursions which unquestionably influence the flow of the blood upwards and perhaps downwards in the spinal canal and probably in the cranial subarachnoid space. Nevertheless, the clinical findings of Dr. Solomon show that for the most part serum put into the lumbar sac does not reach the cistern in a good many minutes. Work which I have done checks up this point. I have sometimes waited for nearly half an hour for the appearance in the cistern of serum introduced into the lumbar sac, as much as 20 c.c. being injected. It seems to me unlikely, even with the patient in bed, that much of the serum which may be introduced will reach the cranial subarachnoid space, and that the conclusions are justified that if serum is to be used in cerebral conditions it should be put where the disease is. This brings up the question of epidemic meningitis. We lose ordinarily 25 per cent of these cases. I believe that we lose a part of this 25 per cent because we do not get the serum around the brain where the meningitis begins.

THE CEREBROSPINAL FLUID IN JAUNDICE

Dr. Hugo Mella read this paper. He had become interested, he said, in the question of what happens to the cerebrospinal fluid in those patients who have been treated with salvarsan who develop jaundice. In 1912 Mestrazat reported a study of the spinal fluid in icterus. He reviewed the work of previous writers who had reported the bile tests positive. He reported four cases and of these four cases only one gave a response to the bile test and that was questionable. The other cases all gave negative tests, but still the fluid was yellow.

Of five cases which we have had at the Long Island Hospital, Boston, one had been treated with salvarsan for seven weeks. He had a negative blood reaction and a negative spinal fluid. After his last treatment he developed a marked jaundice. On testing his spinal fluid we found the Wassermann negative, the precipitation about normal, the alcohol test positive, ammonium sulphate test negative, the gold sol not affected and the usual tests on his urine for bile were positive. His spinal fluid was canary yellow. Tests applied for bile pigment and bile salts were negative. The second case had a positive blood reaction. One week after his last treatment with salvarsan he developed a severe jaundice. In addition there was a question of cord compression as he had a fracture of the first and second cervical vertebrae. There was evidence of a mechanical

* Case	Blood Wasser- mann	Weeks After Atsphen.	Fluid Pressure	Color	Cells	Alcohol	Ammon. Sulph.	Gold Sol
I.	—	7	120	Canary yellow	0	+	0	+1+
II.	+	1	140	Canary yellow	10	++	0	3333211
III.	+	4	150	Golden tint	8	+	+	55544321
IV.	+	1	130	Golden tint	0	0	±	3332211
V.	—	No treat- ment	30	Greenish yellow	4	+	0	
VI.	—	6	140	Golden	0	0	0	

Case	Diag.	Sp. Fluid Wasser- mann	Surface Tension	Nitrous Acid	Iodine	Bile Tests on Urine	Degree of Jaundice
I.	Arthritis	—	Normal	0	0	+	Marked
II.	? Cord Com- pression and Syphilis	—	Normal	0	0	+	Marked
III.	Tabes	+	Normal	0	0	+	Marked
IV.	? Tabes	—	Normal	0	0	+	Slight
V.	Carcinoma of Pancreas	—	Normal	0	0	+	Moderate
VI.	Syphilis	—	Normal	0	0	+	Moderate

block, but on lumbar puncture there was no clinical evidence of a cord compression or subarachnoid block. If there is cord compression there should theoretically be massive coagulation and he had no massive coagulation. The spinal fluid Wassermann was negative, but the gold sol ran 3333211. Whether this curve was due to an old infection or whether the foreign body in the fluid from the jaundice produced this result I cannot say. His bile tests, however, were negative. Of five other cases practically the same facts held true. The fifth case had received no treatment. The patient had a carcinoma of the pancreas and developed a marked jaundice. The spinal fluid was greenish yellow, but not the typical canary yellow that is seen in jaundice following salvarsan. That fluid also, failed to respond to any of the bile tests. The question is why are these fluids colored? Apparently the color is not due to bile pigments, bile acids or bile salts. It might be possible that the meninges are colored and the fluid took its color from them. Xanthochromia will certainly still bear investigation. (See chart, p. 600.)

Discussion—Dr. H. C. Solomon said that the frequency with which Dr. Mella found coloration in the spinal fluid is much greater than is the average. We have punctured a number of patients with arsphenamin jaundice and it has been very rare that we have found any coloration in the cerebrospinal fluid. Recently I autopsied a case of acute yellow atrophy. All the peritoneal fluid and practically all the organs were colored, but in the central nervous system there was not the slightest trace of color. On the other hand I have autopsied cases of acute jaundice in which the coloration was very marked in the central nervous system. Gennerich states that there is a coloration which comes only when concentration of the bile pigments in the blood reaches a certain point, then the central nervous system will be colored and the color will remain there longer than anywhere else in the body. Schmorl states that in three cases in which he found yellow fluid in the ventricles he found that there had been some injury of the choroid plexus and the fluid came through in large amounts into the ventricles.

Dr. Mella (in closing). Regarding the color of the fluids, I have always asked some disinterested person to observe the color so as to check up on its presence. With the quick response to bile tests on the urine and the negative responses in the spinal fluid we have not proved the presence of bile in the fluid in these jaundice cases nor have we been able to determine the cause of xanthochromia.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Nölle. SPLANCHNIC NERVE ANESTHESIA. [Deut. med. Wochenschr., July 1, 1920.]

This author has had disagreeable experiences with this procedure following the Braun method. A half hour after the injection of 0.02 gm. of morphin and 0.0005 gm. of scopolamin, an exploratory laparotomy for suspected cancer of the stomach was performed on a man of fifty-nine years of age. After opening the abdominal cavity under local anesthesia, 100 c.c. of a 0.5 per cent solution of procain and 0.5 c.c. of epinephrin solution (1:1,000) were injected retroperitoneally, in front of the body of the vertebra, on a level with the xiphoid process. No changes were found in the gastrointestinal tract. During the operation the patient lay in a light twilight slumber. As the stomach and the transverse colon were lifted up he emitted a few groans. After the operation he had no recollection of it. Four hours after the operation the patient regained full consciousness, but his face took on an anxious, pained expression. The abdomen was distended. At a slight touch spasmodic jerks of the whole abdominal musculature occurred. The muscles of mastication and the muscles of the neck were not involved. A heavy sweat broke out on the face. The syndrome resembled that of tetanus. As a precaution antitetanic serum was injected in large doses subcutaneously and intravenously. The condition of increased reflex excitability lasted for two or three days. Various hypotheses are discussed relative to the phenomena observed but no definite conclusions were reached.

Steinthal. BLOCKING OF SYMPATHETIC AND VAGUS NERVES. [Zentral. f. Chirurgie, Oct. 16, 1920, XLVII, No. 42, J. A. M. A.]

Steinthal has tried Stierlin's method but his experience has not been favorable. Stierlin holds that the better results securable by means of transverse resection in gastric ulcer as compared with gastroenterostomy are due to the fact that, in addition to the removal of the ulcer, the gastric nerves are severed. This he thinks results in an increase of motility, stopping of the pylorospasm and reduction of the acidity. By the interruption of both the sympathetic and vagus nerves the peristaltic activity is increased through the mediation of the mesenteric plexus; and the interruption of the vagus nerve alone reduces hypersecretion and hyperacidity. In place of transverse section, Stierlin therefore recom-

mends that, in such ulcer cases in which the removal of the ulcer itself is not absolutely necessary, a simple circular incision be made, high up on the stomach, through the serous and muscular coats down to the mucosa, so as to interrupt the nerve paths without opening the gastric lumen, whereupon the incision is immediately closed by suture. Steintal made a practical test of Stierlin's ideas in two cases. A patient aged eighteen, with marked atony and considerable hypersecretion with hyperacidity, was operated on by the Stierlin method. After the operation, normal peristalsis was reestablished, but the hypersecretion was not affected. In the second case, a patient aged forty-five, presented before the operation increased peristalsis, a considerable six-hour residue and hypersecretion. After the operation, motility was unchanged and gastric secretion was if anything increased.

Billet and Laborde. BLOCKING THE SPLANCHNIC NERVES. [*Presse Médicale*, April 2, 1921, XXIX, No. 27.]

The authors believe in the value of this procedure for regional anesthesia for the upper abdomen. Their technic is as follows: The patient lies on his side and the needle is introduced just below the twelfth rib, 7 cm. from the line of the spinous processes. The needle, 12 cm. long, is pushed in until it hits the body of the vertebra. The needle is then slanted at a tangent to the vertebra, until the tip no longer meets with any resistance. Then the anesthetic is injected on one or both sides. It spreads throughout the paravertebral cellular zone, infiltrating the splanchnic nerves and the solar plexus. It is far from a blind method, as the needle is introduced into a well-determined region, and they regard it as one of the best, if not the best, method of anesthesia for operations in the upper abdomen. The only danger, they say, is from the renal vein, and they explain how to avoid contact with this vein.

Rodi, G. BLOCKING THE SPLANCHNICS. [*Arch. ital. di chir.*, IV, 1921, 32.]

Cadaver experiments with nondiffusible injections lead the author to the conclusion that the needle, which should be 12 cm. long and enter from 8 to 10 cm., according to the development of the subject, must be entered 7 cm. laterally from the line of the spinous processes—and not, as hitherto advised by Kappis, “at the lower margin of the last rib,” which is a variable point, but opposite the space between the spines of the twelfth dorsal and first lumbar vertebra. The inclination to the sagittal plane is about 45°. This injection, which should be from 40 to 50 c.c., will the better reach the semilunar ganglia and splanchnic trunks and coeliac plexus, the nearer the point of the needle approximates to the mid-line. It must be practiced on both sides to be efficient. When it is necessary to anesthetize the second and third lateral lumbar ganglia a further similar injection on each side should be made at the level of the first and second lumbar interspinous space.

Brocq. DERMATOSES AND EMOTIONS. [Bull. Méd., December 25, 1920, XXXIV, No. 62. J. A. M. A.]

Brocq refers to congestion in the skin inducing a dermatosis from emotional causes rather than due to toxins. He emphasizes the importance of the emotional instability in such cases, and also of disturbances in menstruation. In a typical case described in an unmarried woman of thirty, bad news induced an attack of urticaria. In one case after an unexpected piece of good news, an eruption developed which progressed to an exfoliating erythrodermia. The attacks sometimes develop after eating certain food or taking certain drugs, but the etiologic dominants are unmistakably the extreme emotionalism and menstrual disturbances, upsetting the balance in the sympathetic system. The congestion and the rapidity with which the skin lesions develop are special features of this group of cases. The congestion may affect the skin or any organ. These cases of *alternances morbides* often prove puzzling. The eruption may last only a few hours or days, a "straw-fire eruption." It may subside completely, but it sometimes progresses to vesicle production or exfoliation. When the localization of the trouble is in the stomach, intestine, appendix, or elsewhere, it is liable to be mistaken for an operative lesion. How many operations, he says, might have been avoided if this emotional congestion had been recognized in time, and how many patients of this kind have been exasperated when the conscientious physician tells them that there is nothing really the matter with them. The trouble is usually the other way, however; the physician assumes pulmonary tuberculosis when the apex is merely the seat of a transient congestion, alternating with skin manifestations. This class of patients sometimes present nervous disturbances which resemble those of serious pathologic conditions but which are only transient storms which harmlessly subside when the congestion wave sweeps on somewhere else in the organism, especially to the skin. In treatment he warns to ascertain any idiosyncrasy on the part of the patient to any drug or food. This requires long study of the case and that the patient should not change his physician. Many mistakes have been made by physicians, surgeons and specialists from the patients neglecting this rule.

In treatment the main thing is peace of mind, with physical repose in a suitable environment, free from annoyances. The diet has to be tentatively regulated but by no means restricted to a debilitating dietary. It may sometimes be useful to prescribe a starvation diet for a few days. He has had cases rebellious to all treatment modified by two or three days of restriction to water, combined with laxatives. An abundant diet has proved successful for vegetarians. This starvation diet had been responsible for much of the nervous impressionability. The physician has need of all his skill in treating this class of patients and modifying his plan according to circumstances. In the extreme case described, great benefit was derived from ovarian and suprarenal extracts. The skin has become

the point of lesser resistance and it has to be strengthened and irritation kept away, the congestions diverted elsewhere. He has obtained good results with very small fractioned doses of tartate of antimony and potassium, 2 mg. of the drug in 5 gm. of water, beginning with 2 tea-spoonfuls a day and gradually increasing to 10. Quinin has been useful in some cases, in fractional doses. In local treatment, talcum powder is usually the best treatment. For this he has the patient lie on a sheet on which 2 or 3 kg. of the powder have been spread and more is dusted on the skin, and the sheet is then wrapped around the body. This is the simplest dressing, and succeeds best in the majority of cases. If a softening application is desired he tries different cold creams or pastes, applying one on one side of the body and another elsewhere, to compare the benefit therefrom.

Dubreuilh. DIFFUSE ACUTE SCLERODERMIA IN CHILDREN. [Bull. Méd., December 25, 1920, XXXIV, No. 62.]

Eighteen cases, five boys and thirteen girls, are here recorded. The sclerodermic onset was usually preceded by a severe upset in the general health, apparently brought about by fright or accident. Treatments have been variable and ineffectual. Thyroid has been given in most of the cases but has not seemed to modify conditions materially. All the cases on record recovered in time, from four months to a year.

Garin. CHRONIC ACQUIRED TROPHEDEMA. [Riv. Crit. d. Clin. Med., September 15, 1920, XXI, No. 26.]

This linotype operator of forty-one years had swollen feet and legs which progressed to a condition of hard, symmetrical chronic edema. This did not seem to be influenced by gravity having developed since 1913 in periods of acute increase, with redness and aching in the regions involved. The present size and aspect suggest elephantiasis. There is nothing to indicate polyneuritis, but many features of the case suggest deficient thyroid functioning. This is evidenced by the sluggishness of the sympathetic system and the arrest of the progressive process under vigorous thyroid and suprarenal treatment. The clinical picture is that described by Meige but lacking the history of heredity.

Quincke, H. ACUTE CIRCUMSCRIBED EDEMA. [Berl. med. Klinik, 1921, XVII, p. 675.]

The author here analyzes 36 cases of "acute circumscribed" (angioneurotic) edema. The cases were evenly distributed among the sexes; the majority occurred between the ages of twenty-one and thirty years, the extremes being thirteen and sixty-eight years. The duration varied from a few weeks to thirty years; average five years. The duration of a single attack varied from a few hours to six days, commonly one and a half days. A single eruption lasted from ten minutes to twelve hours, the majority lasting five to six hours. The intervals

between attacks varied from twenty-four hours to weeks, months or years (twenty-six years). In some cases there was some periodicity, the occurrences being daily at the same hour, or at longer intervals. A few cases showed a time relation to menstruation, either before, during, or after the period. Predisposing factors included psychic disturbances, overwork, postoperative hemorrhage, constipation, different types of food and drugs, sea-baths, warm baths, mechanical pressure, the rays of the sun, and toxins from foci of infection. Fever was present in a few cases. Thirty-nine per cent showed general nervous disturbances, and 13 per cent gave a suggestive hereditary history. A sedentary occupation seemed to be a predisposing factor in many cases. The swellings vary from 2 to 10 cm. in diameter, are raised, but not sharply marked off, either, pale, normal color, or reddened, and usually do not pit on pressure. There is a feeling of tension or burning, sometimes itching. Atypical forms and gradations of Quincke's disease to erythema multiforme, erythromelalgia and Raynaud's disease were encountered. The most common site of occurrence of the swellings was the face (80 per cent), the eyes, lips, hands, arms, tongue coming next in frequency.

Jumon, H. FUNCTIONAL HYPERTHERMIA IN CHILDREN. [Bull. Méd., Paris, April 10, 1920. J. A. M. A.]

Jumon states that during childhood many so-called obscure febrile and subfebrile conditions for which a pathologic cause is sought in vain are in reality purely physiologic hyperthermia and not fever. The adult is a stabilized individual; the child, on the other hand, is an organism seeking to acquire a definite equilibrium. There are many physiologic causes that may produce a variation of temperature in children; of these causes exercise is perhaps the most important. The child is more active than the adult, and activity causes a rise of temperature. A walk of 3 miles at an ordinary gait will raise the temperature of a child, sometimes as high as 100.2 F. Hyperthermia may be of alimentary origin. The temperature is also influenced by the character of the food. Nervous children are naturally more subject to fluctuations of temperature than others. However, the physician should not make a diagnosis of functional hyperthermia until he has made a careful examination of the child and excluded pathologic hyperthermia of obscure origin, of which latent tuberculosis is one main cause.

Cevario, L. ON THE PATHOGENESIS OF DEATH FROM SCALDS. [Pathologica, XIII, 12 and 281.]

Investigations were carried out by means of healthy white rats joined in pairs by lateral coeliostomy. One of each pair underwent experimental scalding of different quality, intensity, and extension. The blood, hematopoetic organs, and central nervous system of both of them were then histologically examined. As regards the blood and hematopoetic organs the alterations changed in intensity according to the degree and

number of scalds as well as according to the length of time through which it was possible to keep the animals alive after each experiment. But they did not essentially differ from those previously described by other authors after experimental scalding of single animals. The alterations of the central nervous system (cerebrum, cerebellum, and spinal cord) were on the whole characterized by intense chromatolytic changes similar to those seen after acute experimental intoxications and infections. In addition, frequent pneumonic and nephritic changes were seen. The interest of these observations, however, does not lie in the alterations themselves but in the fact that they were found to be equally intense and widespread in both animals of each Siamese pair. This justifies the suggestion put forward by the author that in consequence of scalding a toxic substance is produced to which the alterations of the blood, hemátopoetic organs, and central nervous system of the scalded and non-scalded animals are essentially due. The results of Morpurgo's experiments, to which reference has already been made, are in favor of this supposition. [da Fano.]

Wieland, H. ON THE IMPORTANCE OF CALCIUM FOR THE SMALL SENSITIVITY OF THE TOAD TO HEART POISONS. [Biochem. Ztschr., 1922, CXXVII, No. 94.]

Bufotalin, the poison from the toad, is thirty times more poisonous to the grass frog than to the toad. Digitoxin and strophanthin behave in a similar way. The action of these three substances is different in the case of the toad; they cause diastole instead of systole. The same change is produced in a toad's heart by an increase of Ca, the reverse of the effect found in the frog's heart. Strophanthin has been shown to make the frog's heart more sensitive to the action of Ca, so that the difference in the behavior of the hearts of the two animals to bufotalin becomes more intelligible. Both hearts behave in the same way to barium. [Med. Sc.]

de Haas. RELATIONS BETWEEN AUTOMATIC HEART CENTER AND HEART INNERVATION. [Ned. Tijds. v. Genees., Oct. 9, 1920, II, No. 15.]

The graphic methods employed by this author demonstrate the effect of atropin, etc., in a case of heart block. He calls particular attention to the action of even minute doses of atropin by the mouth in inhibiting the functioning of the ventricular synchronisms while displaying no influence on the auricular coördinations.

Lie, O. EARLY ARTERIOSCLEROSIS. [Norsk Mag. f. Laegevid., Nov., 1920, LXXXI, No. 11.]

This investigation was undertaken to determine if vascular disease was correlated with schizophrenia in any way. The author examined seventy men and forty-two women with dementia praecox during the last three years. Arteriosclerosis of the peripheral vessels was evident in

54.4 per cent of the men and in 10.5 per cent of the women. Syphilis could be excluded practically, but all the men and some of the women used tobacco. There seemed to be some correlation between the early use of tobacco, in some as young as four or five, and the arteriosclerosis.

Garmendia, F. S. HEADACHE WITH MILD ENDOCRINE DISTURBANCE. [Revista Méd. del Uruguay, Feb., 1920, XXIII, No. 2.]

This is the report of two cases of headache in which thyroid insufficiency was demonstrable. The headache was relieved by thyroid treatment. In another case a chronic suprarenal insufficiency was incriminated and epinephrin and calcium seemed to cure the patient. In a fourth case a young woman had violent headaches during menstruation, with occasional milder headaches between. Menstruation was painful and scanty. Tachycardia, a soft pulse, and pains in the region of the ovaries pointed to ovarian insufficiency. Ovarian extract treatment relieved the patient. The symptoms in the suprarenal case had been great weakness, frequent nausea, pains in the left hypochondrium, and intense and frequent headaches.

Hodges, J. A. MIGRAINOUS AND PITUITARY HEADACHES CONTRASTED. [Va. Med. Monthly, July, 1921, XLVIII, No. 4.]

This paper supports the assumption that headache is the result of physiological or pathological enlargement of the pituitary. It further states that migrainous headaches occur paroxysmally in neurotic individuals, often with a history of direct heredity, and at any time of life, and are congestive in type, and characterized by periodic attacks of pain, continuing for variable periods in the course of the fifth nerve, and often associated with nausea or vomiting and various vasomotor disturbances which in his experience have been intractable to treatment. Pituitary headaches are localized and persistent in type, and occur in patients showing clinical dyspituitary disorders and, because of dysfunction of the pituitary gland in these patients, there occur pressure symptoms of headache, vertigo and vomiting, which are usually relieved by continuous and proper glandular feeding. The prognosis in migrainous headaches is uncertain and discouraging and generally irresponsive to any treatment before a patient is forty years of age. After forty, there may be improvement or recovery, while in pituitary headache, the prognosis is satisfactory, if treated by appropriate means.

Müller, C. BLOOD PRESSURE DURING SLEEP. [Acta Medica Scandinavica, November 7, 1921, LV, No. 5. J. A. M. A.]

Müller's records of the blood pressure measurements on the sleeping subject supply a basis for adopting this as a clinical method of investigation. His tests were made on average individuals of all ages, and on twenty-seven with high blood pressure, and eighteen with acute or chronic glomerular nephritis. During sleep the systolic pressure in men is 94 mm.

and in women 88 mm. in normal conditions. A pressure 15 mm. higher than this indicates pathologic conditions. In children between three and fourteen, the pressure is usually 6 mm. less than in adults. His research tends to demonstrate that the constant drop in the pressure in deep sleep is due to the relaxation of the tonus of the small peripheral arteries in slumber. The individual differences in the blood pressure in different normal persons during the day are wiped out in sleep, and hence these differences must be conditioned mainly by merely functional variations in the tonus of the arteries—the expression of vasomotor instability. The average pressure during sleep rises after the age of forty-five as a rule, but many of his elderly subjects had a normal pressure in sleep. This testifies that age alone does not necessarily raise the blood pressure. The pressure during sleep thus throws light on the nature of the hypertonia while awake. A pathologic sleep pressure was found in one case with only 115 mm. waking pressure, while the sleep pressure was sometimes found normal with day pressures up to 135 mm. in men and 130 in women. Consequently, he reiterates, the blood pressure in waking hours does not reveal whether it is conditioned by normal or pathologic factors until it is compared with the pressure during sleep. The subjects were given a little barbital before the test measurement to insure sound sleep.

Polettini, B. ON LESIONS OF THE VESSEL-WALLS CAUSED BY ADRENALIN.
[Arch. per le sc. med., 1920, XLIII, No. 63.]

Repeated intravenous or intraperitoneal injections of fractional doses of adrenalin, constantly cause, in rabbits, aortic changes consisting of degeneration and necrosis of the plain muscle fibers of the middle coat. These lesions are followed by distension, atrophy, fragmentation, and destruction of the elastic fibers. The degenerated places in the aorta become lastly extensively calcified. These alterations are identical with those found in the aortae of rabbits, the subjects of idiopathic arteriosclerosis; hence the conclusion that the arteriosclerosis of rabbits can be experimentally reproduced. If adrenalin is directly applied to the walls of arteries, such as the carotid or the femoral, lesions can be observed which do not essentially differ from those caused by injections of adrenalin. But if adrenalin is directly injected into the urinary bladder no lesions of the plain muscle fibers are produced, but only haemorrhages per diapedesis from the blood vessels of the submucosa. These facts suggest the conclusion that the arteriosclerotic changes caused by adrenalin are very likely due to a local and direct influence exercised on the muscle fibers of the arterial walls and only in part or very little to the hypertension which follows the passage of adrenalin into the blood stream. How it is that the influence of adrenalin is felt by the muscle fibers of blood vessels and not by those of the wall of the bladder remains as obscure as the selective action of certain drugs and other substances on determined cells or tissues. [daFano (Med. Sc.)]

2. ENDOCRINOPATHIES—GENERAL.

Romeis, B. EXPERIMENTAL MODIFICATION OF CONSTITUTION. [Müncher med. Wochen., April, 1921, LXVIII, No. 14.]

Romeis reports the transformation of weakly and deformed tadpoles into vigorous and normal animals under systematic treatment with calf thymus.

Fulton, J. F. ENDOCRINOLOGY AND METAMORPHOSIS. [Endocrinology, January, 1921.]

The controlling factors in amphibian metamorphosis, a field in which most fruitful results have been achieved is here reviewed by the author. Results which have been gained, give to these investigations an intensely practical aspect. They indicate that endocrinology as a science will be concerned in the future not only with the physiology of mature individuals, but also with embryological development. He generalizes that the metamorphosis of amphibians cannot take place in the absence of the thyroid hormone and the feeding of growing tadpoles with desiccated thyroid accelerates their rate of metamorphosis. Thyroidectomy interferes with bone growth and causes the liver, intestines, thymus, brain, kidney and spleen to retain their larval condition, whereas gonads and lungs develop normally. But a larva so arrested will metamorphose normally if fed with thyroid extract or with organic iodine. The organic extract of the pineal gland accelerates metabolic processes, but seems to inhibit the growth of the testis. The thymus is primarily a lymphopoiëtic organ and is probably not an endocrine organ. It does not affect metamorphosis and has no influence on sexual development. The cells of the pituitary are closely related in function to the intestinal cells of the testis. The anterior lobe probably stimulates sexual development, accelerates growth and assists in bone ossification.

Curschmann, H. CONGENITAL PREDISPOSITION IN PLURIGLANDULAR INSUFFICIENCY. [Zschr. f. d. ges. Neur., Vol. LIX, p. 264.]

The author disproves a statement of Krabbe that early acquired or congenital pluriglandular insufficiency have been considered in the literature only as concerns cretinism. He enumerates the many forms which have been noted in the German literature clinically as well as anatomohistologically. He finds that congenital hypo- and dysplasias of individual endocrinous glands, especially hypogenital conditions in later pluriglandular insufficiencies, are noted as very frequent. He adds the testimony of another case to his own former communications. He reports congenital, functional and somatic hypogenitalism with absence of secondary sexual characteristics, particularly vox puerilis with hypoplastic larynx; congenital hyperplasia of the parotid gland; hypoplasia of the thyroid gland; symmetric scleroderma of both legs and feet and

a keratitis which may be related to the sclerodermic process; cataract, hypogenitalism and hyperplasia of the parotid gland were here the substratum of a congenital hypoplastic condition of the blood glands upon which after a long post-natal period of latency the progressive multiple sclerosis of the blood glands arose. The rôle of the parotid gland in pluriglandular diseases has not received sufficient attention in the past. Hypoplasia of the testicles, sexual infantilism, etc., often exist congenitally in the myotonic dystrophy which appears due to pluriglandular insufficiency and in myasthenia the pluriglandular condition doubtless plays an important part; also in hypothyroidism, not only as concerns cretinism but also in respect to certain congenital thyrohypoplasias without goiter and a general cretinoid degeneration with signs of hypoplasia of the parathyroid glands. Certain individuals with eunuchoid disposition first develop as adults a typical myxedema under stress of malnutrition or from other exogenous cause, or a myxedema may occur in the involutional period. Rachitis, especially in the retarded form, also osteomalasia are probably dependent upon the congenital polyglandular condition. [J.]

Fränkel, M. THE VALUE OF RÖNTGEN RAYS IN MEDICINE, WITH THEIR SPECIAL ACTION ON THE ENDOCRINE SYSTEM AND THEIR INFLUENCE ON CARCINOMA. [Strahlentherapie, 1921, XII, 850.]

The author opens this paper by a general discussion on the functions of the endocrine glands. He states the cause of the comparative immunity of the spleen to attack by tumor metastases as due to the power of the spleen almost invariably to destroy embryonic tissues transplanted into it, whereas in other organs these tissues not only increase in growth, but not infrequently lead to the formation of teratomatous tumors. He likewise points out that tuberculous affections seldom attack the spleen, thus proving the important part this organ plays in immunity reactions, and claims that X-rays increase its activity in this respect; the greater the effort of resistance in the diseased body the more far-reaching the effects of the Röntgen rays.

He quotes Aschner as showing that after extirpation of the spleen the functions of the thymus are increased; also Pasch, who shows in his critical work the connection between the thymus and the bony system, as proved by the fact that after excision of the thymus defective growth and development of the long bones has been known to set in, and, on the other hand, delay in the healing of artificially-set fractures. Hence he deduces that lack of development in early life, while the thymus is in process of growth, is due to some disturbance of this organ. He quotes this in proof of a previous statement by him elsewhere, that the origin of rickets is probably to be found in such disturbances. When dogs have been thymectomized before reaching puberty the suprarenals become hypertrophied, the pituitary atrophies, and the thyroid gland is enlarged;

inversely, castrated animals developed an enlarged thymus. The injection of thymus extract was followed by lowering of the blood-pressure and leucocytosis. Fränkel states that Schwarz and Lederer found that the substances in the thymus reducing blood-pressure are identical with choline, the antagonist of adrenalin, and that he, Fränkel himself, has already stated elsewhere that choline impedes the action of X-rays. He points out the extraordinary sensitiveness of the thymus gland to the effects of general nourishment and that the connection between the thymus and bone rarefaction is clear. He maintains that it is quite wrong to suppose that this organ, which grows until puberty has been attained and then probably has reached its height, loses its power of function in later years. Microscopic observations prove that it continues to function in later years despite loss of weight. Not until the ages of forty to fifty, the age of increase of carcinoma tendencies, would there seem to be any eclipse of its powers accompanied by sclerosis of the parenchyma.

He quotes the experiments of Klose, Lampe, Liesegang, Hammar, and Hermann, of Breslau, to show the antagonism of the thymus to the ovaries, as proved when, by removal of the ovaries in a bitch, there followed a typical increase of lymphocytes, whereas after the removal of an enlarged thymus in a child a diminution followed; also the injection of thymus extract caused enlargement of the lymph glands; from which he deduces that the secretions of the thymus and ovaries are antagonistic in their effect on blood formation.

The author discusses the general effects of exposure of tumors to X-rays; under this treatment the cells become enlarged, the nucleus being chiefly affected, and an increase of nuclei has been observed. The chromatin is destroyed and in many cases absorbed into the cell protoplasm; vacuoles are produced in this protoplasm, which can be so large that the whole cell soon presents only a network of all that remains of its original structure. The altered tumor-cells are absorbed by the white blood corpuscles in the supporting tissue. The connective tissue itself becomes rich in fibrous strands and presents the appearance of a network; it sends its processes between the tumor cells, collects these in ever-diminishing islands, and finally entirely displaces them. Fränkel quotes these as observations of Simon. He states that according to Strauss the tumor-cells under the influence of X-rays show a complete change in their properties and may indeed be said to be neutralized. It has even been asserted that sarcoma-cells have, under the influence of the rays, changed into normal body-cells. On this assumption the healing of sarcoma by irradiation would be due not merely to destruction of the growth cells but rather to a cell metamorphosis. Should, proceeds Fränkel, this supposed cell metamorphosis prove an indubitable fact, then the extraordinary beneficial effects of irradiation on sarcoma would be explained without further question. There are, however, one or two effects to be noticed as against the glowing results of sarcoma treatment,

and even in sarcoma a differentiation of sensibility to radio-treatment has been observed.

All reflections upon the use of excessively high or intense irradiation appear in a different light when we premise that we can do injury by means of the rays and may even create carcinoma, especially when an endocrine organ, which has a tendency to carcinoma, shows peculiar sensitiveness to rays and so can be injured by too strong doses.

Fränkel quotes Ribbert as stating that through the well-known results of actinotherapeutic measures on lymphocytes the influence of these cells on the curing of cancer has been established. According to his observation a spontaneous decrease of cancer epithelium has been definitely proved as caused by the influence of the lymphocytes. It is possible for a mass of round cells to be formed around carcinoma and lymphocytes, which are inimical to cancer. Ribbert's experiments, says Hans Meyer, would seem to show that this form of chemotherapy would prove to be of benefit if used in connection with ray therapy, as the rays are well known to cause a decrease of lymphocytes, thereby releasing the beneficial toxin.

As to how far the blood itself comes in question in the destruction of carcinoma cells is one of the oldest questions in the study of cancer. The search after the unknown body which protects those free from carcinoma and is lacking in cancer patients is never ceasing. According to the researches of von Kaminer there is present in normal serum a substance which destroys carcinoma and is lacking in cancer serum. The serum of nurslings possesses it in infinitely greater quantity than that of adults; even up to the age of fourteen years this substance is very strongly developed, but diminishes notably in later years.

Continuing his conclusions on the power of irradiation in medicine, he points out its influence in the treatment of goitre and uterine hemorrhage, and the danger in these latter cases of overexposure. He further refers to his work between 1911 and 1914 on the sterilization of criminals and mental defectives, of women suffering from heart and kidney trouble, tuberculosis, and syphilis, through the use of X-rays, and adds that, as shown by him in his statements on strong doses, there was a quicker development of amenorrhoea and a higher tendency to nerve trouble, even to melancholia and psychoses, because of injury to the internal secretory function of the ovaries, whereas with smaller doses very beneficial results were shown, in the renewed vigor, youthfulness, and happier outlook on life of the patient.

Fränkel claims beneficial effects of irradiation in epilepsy, in Graves' disease, and in the increase of milk-supply in mammals. For diabetes he quotes the experiments of Beumer as shown in his article on Röntgen ray treatment of the suprarenals in diabetes, in a case of six and one half years' duration; the first treatment showed a diminution of sugar secretion of from 0.270 mg. to 0.153 mg. and after ten days of radiotherapy to

0.122 mg. He claims the amelioration of pain in arthritis and allied diseases by ray treatment.

One other point is to be noted in the specific influence of the thyroid gland on carcinoma, viz., in the constitution of malignant growths of the thyroid gland. These are sensitive to irradiation in such a high degree that one cannot judge of its effects fully by the surface swelling, but rather by the character of the tumor-cells. The struma maligna shows very varying histological characters there are various kinds of carcinoma and different forms of sarcoma and sarcomatous carcinoma. If there be a difference in the action of the rays on each of such forms, this can only be proved by further experience. Out of six cases which Sudeck, says Fränkel, has treated, one case of sarcomatous carcinoma was entirely cured, and three cases of carcinoma of alveolar character were locally healed. On the other hand, malignant goitre shows as a rule very unsatisfactory clinical results. Only very seldom do these cases come for operation before the outer capsule of the thyroid gland is broken through and the outer parts infected. Sudeck has not yet succeeded in carrying out operations for removal of tumors of this kind with hopeful results.

The author quotes largely from the literature, but only gives references to his own papers. [F. E. R. Medical Science.]

Kaplan, D. M. ENDOCRINOLOGY AND ITS PRACTICAL APPLICATION.
[N. Y. Med. Journ., April 20, 1921.]

Practical endocrinology deals with disturbed functions of the glands with internal secretions. Being practical, it does not include the end products of long standing disease, such as is presented by acromegaly or advanced adrenal decay. Once the situation comprises destruction of tissue and its replacement by connective tissue an attempt to restore a functional equilibrium in the endocrine department will prove unsuccessful. To be able to deliver a state of health approximating a cure the therapist must start at the beginning of disease, *i.e.* before histologic metamorphosis gives the pathologist his structural evidences of disease. This is possible by recording minutely the overlooked signals of endocrine constitutions, signals which sound the alarm long before structural crippling takes place. And thus a pyramid of useful data accumulated which would require a library for its housing. Dark pigment distributed over the body is no longer a coincidence, but a definite index that it has something to say regarding the tone of the body, particularly in the domain of the adrenals. The emotions are roused to a degree almost incompatible with social standards, signifying that the individual possesses a thyroid apparatus supplying an excess of its secretion, and giving one of the first echoes of the distant storm, Morbus Basedowii, which at this stage can be remedied with suitable drugs. The sanitarium is not for them, but the home and its soothing domesticity. What a mother will accomplish no nurse did, nor will. For the unfortunate candidate of this

thyroid disease an intelligent mother is the safest shock absorber, and a shock is the Basedowics undoing. The boy who grows inordinately tall, who had mumps, and presents the rounded body and plump breasts, may even be an intellectual giant, but he has been cheated out of his sexual equilibrium, and will sooner or later show his deficiency sexually, psychically or somatically. Mumps as a gonadal enemy cannot be discarded, and the child ought to be watched and treated before it becomes a delinquent or outcast. In its attempt to correct the harm the gonads secondarily drag in the pituitary. But this gland in offering its help demands its pound of flesh, and stigmatizes the sufferer beyond escape. When the pituitary itself demands help, provided the urgency is not very great, then we have firstly, enlarged tonsils and if the condition persists then the appendix becomes troublesome. Still, an operation for either is by no means indicated as yet, particularly when the abdominal distress is accompanied by a great deal of gas formation. I take the stand that promiscuous appendectomies are glaring surgical sins, and unwarranted tonsillectomies are crimes. [Author's abstract.]

Löffler, W. INTERNAL SECRETION AND THE NERVOUS SYSTEM.
[Schweizer Archiv f. Neurol. u. Psychiatrie, 1921, VIII, No. 2, J. A. M. A.]

Löffler comments on the way in which study of the internal secretions has thrown light on the reciprocal dynamic relations between the nervous system and metabolism, and between the nervous system and the cardiovascular system. Even mental processes are conditioned in part by processes of internal secretion, and (even more important) these in turn reflect the influence of psychic processes. The great unifying principle of the internal secretions, he says, forms a band uniting the various branches of medicine, and it is impossible to overestimate the value of such a band in these days when everything seems to tend to drive the various disciplines farther apart. One of the most convincing data cited is that stimulation of the splanchnic nerves in animals does not have much effect on blood pressure if the efferent veins from the suprarenals are clamped, while the blood pressure rapidly rises if the veins are left open. Puncture of the fourth ventricle has no action likewise if the efferent suprarenal veins are clamped. This hormone secreted by the suprarenal, he remarks, is the only organ-specific endocrine substance chemically isolated as yet. The low pressure common in Addison's disease and the extreme sensitiveness to epinephrin of patients with this disease are well established facts, as also the disappearance of the lipoids in the suprarenals in affections with much muscular strain, as in clonic convulsions, psychomotor agitation and in certain infections. Steinach's experiments have confirmed with even stronger testimony Brown-Séquad's assertions in regard to the potency of the internal secretion of the testicles. As Steinach ligates the vasa deferentia, or as a testicle is transplanted, the retention of the products of the secretion allows more of it to get into the blood and thus

act on the nervous system. The sensation of rejuvenation is thus evoked by this erotization of the central nervous system.

Hammett, Frederick S. CHANGES IN THE ENDOCRINE GLANDS OF A TUMOR-BEARING FEMALE ALBINO RAT. [Endocrinology, 1921, V, 216-220.]

This paper is a brief report of the deviations from the normal of the weights of the endocrine glands and other body organs found in a female albino rat suffering from a nonmalignant hematoma with a myxocavernous type of hemangioma. The tumor was situated in the lower abdomen and was not attached to any specific structure. No thyroid or parathyroid tissues were found present. The hypophysis was enlarged as was the spleen and the adrenals. The ovaries and the thymus apparently had hypertrophied. The endocrine system as a whole had evidently suffered notable disturbances which can be attributed as associated with the presence of the pathological condition. These observations lead to the opinion that an investigation of the functioning of the glands of internal secretion in similar cases in man might lead to important findings in diagnosis and treatment. [Author's abstract.]

Edelmann and Saxl. POLYGLANDULAR INSUFFICIENCY. [Wien. Arch. f. inn. Med., November 15, 1921, III, Nos. 1-2. J. A. M. A.]

Three cases are described in which there was polyglandular insufficiency of the glands with an internal and with an external secretion. The patients were two women and one man, all in the fifties, and the course of the disease to the fatal outcome ranged from twelve weeks to eight years. Atrophy of the tongue, anacidity of the gastric juice, moderate diarrhea, fat stools and osteoporosis in two cases, sclerodermia in two were the most striking manifestations. The thyroid was very small, the pancreas atrophied in two, and, in all, the internal organs were small and atrophied.

Hammar, J. A. A PLEA FOR SYSTEMATIC RESEARCH WORK IN THE ANATOMY, NORMAL AND MORBID, OF THE ENDOCRINE SYSTEM. [Endocrinology, Vol. IV, pp. 37-46.]

The study of the endocrine organs has its weak point, which forms a positive risk to the sound development of this branch of science. This weak point is the want of close anatomical insight into the organs in question. Which of us is able at the present time to tell how much or how little of the medulla of the adrenals is present in a man or woman at a certain age before the limits of the normal are exceeded? What is our present knowledge of the extent to which the so-called gland of puberty is to be found at a certain age in a normal human sex gland? Or of the relation between the quantity of acinar and trabecular tissue in the normal thyroid? Or of the normal total number and size of the

islets of Langerhans in the pancreas at a certain age? There is no end of questions of such a kind that crowd upon us in this sphere without our being able even to sketch an answer. The real significance of these conditions is that neither dissected material nor experimental work can, as matters now stand, by any means be made duly profitable to science. In the first place normal data of comparison are a pressing need. Whether there is an increase or a diminution, whether too much or too little, can only be decided when we know sufficient about the range of the normal variation under corresponding circumstances as to age, sex, etc. Mainly in order to give an orientation as to the position of an individual value within/or outside/the normal range the average may be of importance. Secondly, only such organs as come from individuals who have suddenly died in full health and not by disease are available for the purpose. In the case of human beings, principally organs from murdered people, executions, accidents or suicides will thus come into consideration for determining the normal range of variation.

Generally, one will not make much progress by using merely the size of the organ. It is well known that a change in size may, under different circumstances, have quite a different bearing. For this reason we must elaborate for every endocrine organ special methods which admit of a quantitative—numerical—determination, with sufficient accuracy, of the material components of the organ. Thus, for instance, in the hypophysis, with accurate elimination of the connective tissue, the amount of each of the three principal portions ought to be ascertained. In the anterior portion the number of the different cell types, in the intermediate portion the number and size of the cysts with and without colloid should be approximately settled. In the thyroid the weight of the true parenchyma similarly with deduction of the bulk of the connective tissue is to be ascertained; again, in the parenchyma the amounts of the trabecular and adenomatous territories, respectively, should be fixed apart from the acinar portion; and in the last mentioned part the number and size of acini with and without colloid should be calculated. Similarly, in the parathyroids the true parenchyma, the trabecular and cystic tissue should be treated separately. Here, moreover, we meet with the task of approximating the relative and absolute numbers of the acidophil cells. With regard to the pancreas, the next object should be to ascertain the quantity of the endocrine and the exocrine parenchyma as well as to calculate the number and size of the islets of Langerhans. In the adrenals the quantity of the cortex and the medulla as well as of the different zones of the cortex requires to be expressed numerically. Concerning the sex glands, it is of special importance to ascertain the amount of endocrine tissue, in doing which for the ovaries, the corpora lutea and the other so-called lutein tissues should be considered separately. To settle the number and size of the ovarian follicles lies within the bounds of possibility. To figure the state of the spermatogenesis seems, at all events in the case

of the human being, where the process passes on so irregularly, a difficult task; but it would, however, evidently be of great importance.

In all these enumerations we cannot stop at apparent or relative values; the real and absolute amount must be approximately fixed. In working out the respective methods every organ must be made the object of a comprehensive revision which takes into consideration not only the normal but also the morbid organ structure, the various functional changes, faults caused by shrinkage or swelling and otherwise during the technical treatment, etc. And before such a method is seriously put into practical use, its precision must have been duly tested. Furthermore, all this must be done for every separate species that is dealt with. It is evident that as soon as normal material, sufficient both in quantity and quality, has been numerically analyzed in the manner described, any case of disease, analyzed in the same way, can with far more ease and, what is of still greater importance, with far greater certainty than at present, be estimated in all the respects that have been objects of the analysis. By following the attained norms, we shall be able to decide whether a value from a case of disease falls within or outside the range of the normal and in what direction an eventual displacement has occurred. The important questions about the interrelations of mental and hormonal functions, the connection of mental diseases with troubles in the endocrine system belong to those problems which without a deepening of our anatomical knowledge by exact quantitative work we may never be able to solve. [Author's abstract.]

Mussio-Fournier. SOME RARE ENDOCRINE DISTURBANCES. [Paris Méd., December 17, 1921, Vol. XI, No. 51. J. A. M. A.]

The essentially variable character of the disturbances, simulating widely diverse affections, was the main feature of Mussio-Fournier's two cases and of eight reported to him by others. In one, the almost kaleidoscopic clinical picture from the age of twelve to forty-seven can be explained by fleeting congestion at various points, of endocrine origin, and predominantly from defective thyroid functioning, although the amenorrhœa pointed to the ovaries, and certain other symptoms—which subsided under epinephrin—indicated participation of the suprarenals. In the second case, thyroid treatment was given, and at once all the symptoms subsided and have not returned. In Hutinel's case, edema developed at the menopause of a previously healthy active woman, tending to leanness rather than obesity. The edema was followed by hemiplegia. After six months of this, tentative thyroid treatment cured at once the hemiplegia, edema and menorrhagia. In his first case, at different times the woman presented swelling and pain in the femur, tibia, humerus and ribs, sometimes on one side and then on the other. These foci were extremely painful, and an operation was performed on several occasions, with absolutely negative findings, nothing being discovered but a focus of congestion.

2a. THYREOPATHIES.

Abrahamsen. THYROID EXTRACT IN KÖHLER'S DISEASE. [Hospitalstidende, February 9, 1921.]

In this clinical paper the author points out that opinions are still divided as to the etiology of that disease of the scaphoid bone which is associated with Köhler's name. It may be due to (1) trauma—that is, fracture of a healthy bone; (2) fracture of a dystrophic bone; or (3) delayed ossification—that is, a dystrophic condition only. The author supports the last hypothesis, since thyroid treatment has been so beneficial. Before this treatment was instituted in the case of a lad, aged seven, the X-rays showed hardly a sign of ossification in the scaphoid bone on the right side, whereas on the left side the X-ray picture was normal. For the next two to three months he was given 15 cg. of dried extract of thyroid daily. At the end of this period the X-ray picture had changed completely; while on the first occasion it had shown almost a total absence of ossification, it now showed a well developed center of ossification about 7 mm. long. Its shape was irregular, and the outline of the bone corresponded closely to the characteristic features of Köhler's disease. As there was no history of trauma in this case, and as it was difficult to assume the existence of a fracture in the soft and cartilaginous scaphoid, the condition should be regarded as one of delayed ossification.

Schmidt, E. O. EXOPHTHALMIC GOITER. [Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1921, Vol. XXXIII, No. 4.]

The author first summarizes at least half a dozen of the current generalizations regarding the action of the thyroid factors in exophthalmic goiter and says that the evidence seems to indicate that the thyroid secretion becomes changed and its power of dispersion is increased. Owing to this extreme dispersion, the follicles are damaged, and regenerative proliferation of epithelium follows. Chemical tests for colloids confirm the essential difference between exophthalmic goiter and simple hyperthyroidism and the postmortem histology also aids. Operation on the thyroid reduces the secretion and the circulation may modify the dispersion. Operation is liable to flood the blood temporarily with the modified secretion which may become more of a gel. In hyperthyroidism, the thyroid secretion is an unfinished product, but it exerts a toxic action. In exophthalmic goiter, on the other hand, the secretion is an overdeveloped, overripe substance. The findings with the colloid chemical tests are tabulated from a large number of cases, especially the different characteristic responses to treatment of the blood serum with potassium iodid and silver nitrite, followed by a hydrochinon photographic developer. The freezing point of the blood is different in hyperthyroidism and in exophthalmic goiter, which he believes offers further evidence of essential differences.

Hernaman-Johnson. X-RAY TREATMENT OF GRAVES' DISEASE. [Arch. Radiology and Electrotherapy, June, 1921.]

The author discusses the position of X-rays and electricity in the treatment of Graves' disease. The benefit derived from X-ray treatment is usually very pronounced, pulse rate and sweating diminishing, and definite improvement taking place. Usually the applications are over the thyroid, though some observers apply the rays over the thymus and over the sympathetic in the neck, the good effects appearing to be constitutional as well as local. It is best to commence with small frequent doses, combined with rest in bed where practicable, and the treatment should be given a trial even in apparently hopeless cases. While an acute case may respond rapidly to treatment, chronic cases may require in addition dental treatment, gastric extracts to aid digestion, salicylate of bismuth to control fermentative diarrhea, galvanism for the exophthalmos, and psychotherapy to regulate sleep and menstruation. X-ray treatment is used for its local regulating action and for its constitutional effect, and it should be commenced as soon as the disease is diagnosed. It should be regarded not as a rival but as an adjuvant to surgery, and, except in so far as its early employment tends to reduce the number of cases coming up for surgical consideration, its use need not affect the question as to when an operation becomes advisable. After operation the application of electricity to the remainder of the gland will diminish the risk of recurrence.

Passman, F. R., and Mestre, R. EXOPHTHALMIC GOITER IN PREGNANT WOMAN. [Semana Médica, April, 1921, Vol. XXVIII, No. 15.]

In this clinical report pregnancy and the exophthalmic goiter developed side by side. The condition became grave at the sixth month, the dyspnea extreme, the pulse 180, increased agitation in spite of all treatment. Abortion was followed by symptomatic recovery.

Woelz, E. DIFFERENT FORMS OF GOITER IN DIFFERENT ENDEMIC FOCI. [Schweiz. mediz. Wochen., July, 1921, Vol. LI, No. 27.]

Woelz compares 600 operative cases at Basel with 400 at Berne, omitting the malignant cases. Cretinism is rare in Basel; men there are affected with goiter much less frequently than women, and the goiters are more of the diffuse type, and larger.

Grunenberg. VEGETATIVE NERVOUS SYSTEM IN EXOPHTHALMIC GOITER. [Deutsche med. Woch., June, 1921, Vol. XLVII, No. 23. J. A. M. A.]

Grunenberg reports that in twelve exophthalmic goiter patients and ten cases of hyperthyreosis the excitability of the vegetative autonomic nervous system was tested before and after operation. Before the operation, the patients showed, for the most part, a sympatheticotonic, but a minority presented a normal type of the epinephrin blood pressure curve after injection of 1 mg. of epinephrin. In the group with the normal parabolic curve, pronounced lymphatism was always present. After the

operation, the excitability of the sympathetic system gradually decreased, so that the sympathetoconic epinephrin blood pressure curve became normal. In some cases it became even markedly vagotonic. The results of other functional tests of the vegetative autonomic nervous system corresponded to these findings. At the same time, it was established that in sympathetoconic subjects the course of the epinephrin pulse curve corresponds closely to the blood pressure curve. In spite of marked and rapidly increasing blood pressure, there is no primary retardation of the pulse. The result of the investigations points to an elective sensitizing effect of hyperthyroidism on the sympathetic nervous system.

Seitz, E. EXOPHTHALMIC GOITER AND VEGETATIVE NERVOUS SYSTEM. [Zent. f. innere Med., October 29, 1921, Vol. XLII, No. 43.]

Among the factors apart from the thyroid proper, a condition of the vegetative nervous system has been held to be the real underlying cause of exophthalmic goiter. The behavior of the blood sugar is one of the indices for the condition of the vegetative nervous system. He undertook to test the blood sugar metabolism in fifty cases of strumectomy. A few days before the operation he examined the patient for the blood sugar value, fasting, and also an hour after test ingestion of 100 gm. of glucose. In a portion of the cases the same test was made with 0.75 mg. of epinephrin. In a large majority of the cases, the same tests were made two weeks after the operation, and in a few instances after still longer intervals. From his findings the author infers that very frequently—but by no means constantly—in affections of the thyroid gland the vegetative nervous system, particularly its sympathetic pathways, are hyperexcitable.

Coulaud, E. THYROID TREATMENT AND TUBERCULOSIS. [Annales de Médecine, November, 1921, Vol. X, No. 5. J. A. M. A.]

Coulaud relates a number of examples of the flaring up of latent tuberculosis under the influence of thyroid treatment. This was particularly pronounced in three women with "thyroid rheumatism." The severe rheumatism improved materially under thyroid treatment, but the patients began to cough and develop active pulmonary tuberculosis. Souques has reported two similar cases, the women recovering almost completely from their painful polyarticular rheumatism, but dying soon after from pulmonary tuberculosis. All tests for tuberculosis had been negative before. One of these patients took 316 doses of 0.1 gm. of thyroid extract in the course of eight months; the pains and stiffness reappeared when the treatment was suspended. One man of forty-seven with chronic rheumatism improved spontaneously as pulmonary tuberculosis became installed. As the symptoms of rheumatism returned, thyroid treatment was begun and this seemed to speed up the lung process. The thyroid seems to be exceptionally active during menstruation, pregnancy and the menopause, and in these periods the resisting power to tuberculosis seems to be at its lowest ebb. Rist has recently reported some cases in which the onset of

tuberculosis coincided with the beginning of a pregnancy. In Coulaud's experience, in eleven of twelve cases of pulmonary tuberculosis in women with goiter, the tuberculosis began at the menopause. In another woman a course of thyroid and iodine treatment for goiter was followed by a period of coughing and hemoptysis as the goiter improved. This occurred twice in a few years.

Campbell, J. M. H. SOME ASPECTS OF EXOPHTHALMIC GOITER. [Quart. Jl. Med., October, 1921.]

Campbell has dealt especially with the etiology and prognosis. The conclusions are based on 127 consecutive cases treated in Guy's Hospital during the ten years 1908-1917. Over 70 per cent were traced until their death, or for a varying period after their admission to hospital—at least four and sometimes sixteen years.

The cases fall readily into the two groups which were first clearly differentiated by Plummer, and it is suggested that the names exophthalmic goiter and hyperthyroidism should be reserved for these two groups respectively.

True exophthalmic goiter (Graves' or Basedow's disease) is a well defined condition, in which the majority of the following signs are present within a short time of the onset of the illness—exophthalmos, enlarged thyroid, tremor, tachycardia (pulse rate over 100), increased metabolism, increased sweating and undue nervous excitability. Amenorrhea is generally present. More severe mental changes and bouts of pyrexia and diarrhea are characters of the disease, but are not so constantly present.

Hyperthyroidism is suggested as a convenient term for a less sharply defined group of cases, in which only two, or three, or perhaps four, of these signs are present. The middle aged woman, who has had a goiter or adenoma of the thyroid for many years without any symptoms, and later develops symptoms and signs of hyperthyroidism is the common example of this type. If Plummer's original group is widened to include these cases, it becomes of even greater clinical value, because there are certain broad resemblances between all these cases. It does not tend to develop into true exophthalmic goiter. It is as a rule less serious and the patient is more easily cured especially by surgical methods. It is less often fatal. It occurs generally in older women and often a goiter or an adenoma of the thyroid has been present for many years without giving rise to any symptoms.

True exophthalmic goiter has always been found to be much more common in the female than the male. In this series the proportion was 17 to 1. Cases were very rare before puberty; increasingly common from fourteen to twenty-four; still common from twenty-five to thirty-four; relatively uncommon from thirty-five to forty-four; and much

rarer after this age which may be taken as corresponding with the menopause.

Exophthalmic goiter was four times as common among unmarried as among married women—even after making allowance for the age incidence of the disease. Nearly 70 per cent of all cases occur in unmarried women of child bearing age. Among the married women in whom the disease started before forty there were very few with more than one child. It is difficult to decide whether exophthalmic goiter is specially liable to occur in unmarried women and women who are not bearing children, or whether in sufferers from the disease there are already present before the development of signs or symptoms, some abnormality which makes marriage and pregnancy less likely. The first alternative seems the more probable. In spite of the rare cases developing during pregnancy, and the more common cases starting after a confinement, there is some evidence that pregnancy may have a favorable influence on the course of the disease. But one must remember that typical cases do occur in men, in women in whom the ovaries are no longer fully active, and more rarely in children before puberty.

While the majority of the signs and symptoms of exophthalmic goiter may be explained by an oversecretion of normal thyroid substance, the facts are sufficient to show that that may occur much more readily during the period of life when the ovary is functionally active; but that the cyclical physiological changes of pregnancy are in some way antagonistic to the development of Graves' disease.

Another point discussed was the lowered resistance to infection of patients with Graves' disease, and it was suggested that that was one reason for the frequent deaths from bronchopneumonia after operations.

The cases studied were sufficient to confirm the relatively good prognosis under medical treatment, which was found by Hale White in a similar series of cases. Forty per cent were almost cured and another 30 per cent were able to return to a normal life or at least perform a fair amount of work without inconvenience; 15 per cent were not much improved or became chronic invalids; and 15 per cent died of the disease.

Of the cases treated surgically the most striking features were the *immediate* improvement after the operation and the consequent shortening of the period of convalescence. The number of cases so treated was small but suggested that the *ultimate* results were very similar to those obtained by medical treatment.

The average duration of the disease was three years and most of the deaths took place in the first year.

The statistics of the Registrar General for the seven year period 1913-1919 were carefully investigated and it was found that (assuming the relative mortality in different areas to be the same) exophthalmic goiter was nearly twice as common in the country districts as in the large towns.

Even after allowing for the relative density of population it was much more common in the west of England than in the east—especially in Devon and Cornwall, in Wales and in Cumberland and Westmoreland. In general these counties are mountainous and sparsely populated with the old Celtic stock. Equally definite evidence for the distribution of ordinary endemic goiter could not be obtained but the facts rather support the belief that where endemic goiter is common exophthalmic goiter is rare. [Author's abstract.]

Bram. EXOPHTHALMIC GOITER AND DIGITALIS. [Med. Record, February, 1922.]

The author considers that digitalis may be of value in the passive stage of exophthalmic goiter when it is well tolerated and the patient readily responds to its action, but that in the active stage it is harmful and may aggravate the syndrome. Very occasionally and cautiously used in auricular fibrillation its intermittent administration may help to regulate cardiac action, but will not lessen frequency. In the passive stage it is best administered for three or four weeks and then withdrawn, to be administered again for a short course should the heart rate show signs of rising above normal, after which it will be possible in most instances to withdraw it permanently without fear of a fresh rise in frequency. Dosage should be small and results awaited rather than attempt to obtain a physiological effect quickly, and a standardized preparation should be used so that its effect can be carefully watched.

Loewy and Zondek. EXOPHTHALMIC GOITER. [Deut. med. Woch., November 17, 1921, Vol. XLVII, No. 46.]

In this clinical paper these observers discuss the commonly accepted view that in exophthalmic goiter iodine was contraindicated. Certain observers had shown that, contrariwise, small quantities of iodine are well borne. In their series of cases they were unable to show that potassium iodide in doses of a few milligrams would improve not only nutrition but also the general subjective condition of the patients. They showed, furthermore, that the improvement was accompanied by a reduction in the generally increased metabolism. Thus the decrease in the gas exchange in three different cases was 19.9, 28.8 and 29.5 per cent, respectively. Successful treatment depends, in a great measure, on a careful regulation of the dosage. At first 3 drops of a 5 per cent potassium iodide solution should be given. The weight of the patient should be carefully watched and the doses slowly increased as long as the weight continues to increase. The upper limit of tolerance varies individually, 20 drops three times a day being the maximal dose in some cases. When the weight begins to fall and the subjective wellbeing tends to grow worse, the dosage must be reduced or the use of iodine discontinued for a time. It may then be recommenced.

II. SENSORI-MOTOR NEUROLOGY.

1. PERIPHERAL NERVES—GENERAL.

Inman, Thomas G. NEUROLOGICAL FINDINGS IN ONE THOUSAND GROUP STUDY CASES. [California State Journal of Medicine, November, 1921.]

Of this number 683 gave a total of 1756 complaints referable to the nervous system—nervousness 494, pain 371, depression 189, numbness 181, weakness 175, paresthesias 99, tremor 87, sleeplessness 68, dreams 56, and flushes 45. There were only 334 actual neurological diagnoses, and of these 224 were uncertain as regards the organic nature of the lesions. It would appear, then, that a very large proportion of the complaints referred to the nervous system were the outcome of disease elsewhere in the body. Of the diseases of the nervous system, 110 were of known organic nature. Brain tumor was diagnosed 7 times, caudal tumor 3 times, combined sclerosis once, cerebral diplegia 3 times, hemiplegia once, Parkinson's disease once, lethargic encephalitis twice, myelitis twice, neuritis 7 times, peripheral neuritis 4 times. Syphilitic involvement of the nervous system took the form of cerebrospinal syphilis 69 times, of tabes 4 times and of paresis 3 times. In the group with a pathological foundation of unknown nature, epilepsy with deterioration was diagnosed 18 times, and epileptoid attacks without demonstrable deterioration 18 times. There were 40 diagnoses of thoracic neuralgia, 25 of occipital neuralgia, 7 of trigeminal neuralgia and 1 of obturator neuralgia. There were 65 cases in which a diagnosis of psychoneurosis was made without the type being definitely stated, 6 of hysteria, 6 of anxiety neurosis, 14 of neurasthenia, and 3 of psychasthenia. Of the insanities, 4 were diagnosed as toxic psychoses, 3 as of the manic-depressive type, 2 as dementia precox and 1 as hypochondriasis.

That pathological conditions elsewhere in the body frequently exert their first noticeable effects upon the nervous system is well known, and we have found this fact to be true in a large proportion of our cases. With only 16 per cent of the cases with nervous symptoms showing definite disease of the nervous system, it seemed that it might be of interest to tabulate the other diagnoses noted in the 683 cases. They are as follows: Mucous colitis 386, infected teeth 370, infected tonsils 295, infected prostate 133, cholecystitis 45, infected tubes 12, infected sinuses 8, arteriosclerosis 196, arthritis 174, lues 90, visceroptosis 151, toxic cardiopathy 28, nephritis 25, thyrotoxicosis 90, hypothyroidism 14, lack of pelvic support 25, hemorrhoids 14, gastric ulcer 7, duodenal ulcer 10, lac. cervix 10, abdominal adhesions 5, pernicious anemia 4.

The only generalization made by the writer is concerned with the multiplicity of diagnoses. In the presence of a number of known pathological conditions, the duty of the physician would seem to be clear, and each condition should be removed where possible. No attempt should be

made to treat an individual as a psychoneurotic until a complete examination has been made, and pathologic changes of the organs removed. [Author's abstract.]

Bénard, R. NERVOUS COMPLICATIONS OF GERMAN MEASLES. [Bull. d. I. Soc. Méd. des Hôpitaux, November 4, 1921, Vol. XLV, No. 31.]

In a recent epidemic of German measles in soldiers in which 291 were affected the author discusses the following neurological syndromes: Thirteen of the patients had transient meningitis; in one the meningitis was of an intermittent form. Landry ascending paralysis developed the fourth day of typical rubeola in one patient, who died. Herpes zoster in one case. These and other slight nervous manifestations occurred in 4.5 per cent of the cases.

Head, H. CERTAIN ASPECTS OF PAIN. [Br. Med. Jl., January 7, 1922.]

This well known investigator again reverts to a subject which he has long had under observation. In this address he summarizes the facts which he himself has observed regarding pain sensations and sets out some important points in their interpretation. He considers particularly pain of visceral origin. So long as the internal organs are performing their functions the afferent impulses which they originate do not enter consciousness. This is explained by suggesting that the cerebral cortex, which is responsible for the discriminative functions of sensation, exercises a dominant influence over the lower centers, represented by the optic thalamus, whose reactions are impulsive and urgent. These impulse reactions may be evoked either by a noxious stimulus, which reaches a high enough grade of intensity to overcome the inhibition of the cortex, or by disease or injury interfering with the paths through which the cortex normally exerts its control. But even when no such interference exists there is reason to think that once the path has been opened and dominance of the higher centers overcome a weaker visceral stimulus will be followed by sensation, so that long-continued visceral irritation may give rise to pain from apparently inadequate causes. If the pain is extremely severe it may spread widely even in normal persons. Should a referred pain become chronic this forms an even more important cause for its diffusion. Menstruation, anemia, and debilitating psychological states, such as worry or emotional shock, may produce similar effects. Occasionally, central resistance to potentially disagreeable impulses is temperamentally so low that pain may occur without any obvious cause for peripheral stimulation. In such cases the order in which the phenomena appear does not follow rules that can be laid down for pain of visceral origin. However, much knowledge may be gained by a study of pains arising from visceral disease, though they cannot be interpreted without a knowledge of the relation of afferent impulses to the segments of the central nervous system. As an illustration Head cites the common condition produced by tension within the

aorta which produces pain referred to the sixth and seventh thoracic and adjacent segmental areas. On the other hand diseased conditions of the aorta and the ventricle may be associated with similar areas higher up on the chest, or in the region of the third or fourth cervical.

Kauffmann, F. LATENCY OF SENSATIONS IN HYPERALGESIC AREA. [Münch. mediz. Woch., September, 1921, Vol. LXVIII, No. 37. J. A. M. A.]

Kauffmann discusses the various methods in use for testing the sensitiveness to pain of different areas of the body, and recommends a method which he has found superior to the common test by pinching a fold of the skin. He fills a test tube with hot water and inserts a thermometer, so that the temperature of the water may be read at any time. He found a temperature of from 50-75 C. the most favorable for comparative tests. The base of the test tube, which is flat, is allowed to rest without pressure on the part to be examined. The surface of the base is about 1.5 sq. cm. With a stop watch he measures the time that elapses between the application of the irritant and the first sensation of pain. The measure for the sensitiveness of a given skin area is the latent interval before the pain sensation.

Boorstein, S. W. ORTHOPEDIC TREATMENTS IN CHRONIC NERVOUS DISEASES. [Med. Record, August, 1921, Vol. C, No. 9.]

In this clinical paper the value of general orthopedic principles in the treatment of chronic nervous disorders is advocated. He details the methods employed in Montefiore Hospital. They include medications, but the main work is left to the orthopedic surgeon.

Kappers. NEUROBIOTAXIS. [Encéphale, January, 1922, Vol. XVII, No. 1.]

In a continuation of his work on the relationship between structure and function Kappers here contributes a tenth communication. The nutritive tropism of the dendrites is particularly investigated and further proof of his neurobiotaxis hypothesis is offered.

Laignel-Lavastine. RECENT PROGRESS IN NEUROLOGY. [Médecine, February, 1921.]

This is a short review of the chief work in neurology done in France in 1921. It is already abstract in form and further abstracting is not a just representation of the article. The knowledge of epidemic encephalitis which is now commencing to be assembled is throwing light on many nervous affections previously obscure, such as paralysis agitans, chorea, and dementia precox—all these syndromes have been realized by epidemic encephalitis. It has further confirmed the connection between infection and maniacal excitement; the rapidity of the development of the psychiatric consequences of the causal infection has convinced everyone of the direct relation. He regards as further progress the introduc-

tion into therapeutics of phenobarbital and of soluble cream of tartar, both of which, he says, have proved very useful in treatment of epilepsy. For severe trigeminal neuralgia now, only the sensory root of the nerve is resected. Martel operates for a tumor in the cerebellopontine angle, under local anesthesia, by the Cushing method, the patient seated. Another achievement is what is called colloidal psychiatry, seeking to utilize the anaphylactic shock, based on Widal's study on colloidal shock, the *crise hémoclasique*, in treatment of states of pathologic anxiety. Marie has reported improvement in a grave case of bulbosplinal myasthenia under suprarenal treatment, and Vernet has cured vertigo with it in many cases in which vasomotor disturbance was evidently a factor.

Démètre, Paulian E. COMPLICATIONS OF THE NERVOUS SYSTEM IN TYPHUS.

Exanthematic typhus has decimated our army and our population during the war. It is an epidemic, infectious and contagious disease, the specific organism of which is as yet unknown. It is transmitted by an intermediary host, the flea (louse?). At the onset it resembles influenza, with chills, prostration, and fever which rises daily. The rash appears on the fifth day after the onset of the fever. The incubation period is usually fourteen days after the bite of the insect. In most cases the fever falls on the fourteenth or fifteenth day.

The complications of the nervous system may set in during or after the febrile period. *During the fever* we have nightmares, delirium, carphology, coma vigil, rigidity of the neck, Kernig's sign, irregularity of the pulse, cyanosis of the extremities. Hiccough is of grave prognostic significance. *During convalescence* hemiplegia may develop (in most cases without endarteritis) nuclear lesions with their various paralyses, psychic disturbances such as delirium, maniacal excitation, mental confusion, medullary lesions, etc. In addition to these disturbances of the central nervous system there may be peripheral involvement, as neuritis and polyneuritis; facial diplegias, which occurred in three of our cases; rigidity of the joints and functional disturbances of the gait. There may be disturbances of the glands of internal secretion, and various other numerous complications. A meningeal reaction is obtained in all cases from the onset, and may remain for a year, or longer, after convalescence. [Author's abstract.]

Henriksen, P. B. CULTIVATION OF NERVE TISSUE. [Act. Chir. Scand., 1921, Vol. LIII, No. 265. Med. Science.]

Notwithstanding the title of this paper, the observations it records are purely histological, and are regarded by Henriksen as proving that regeneration of peripheral nerve is a function of the neurilemma nuclei and does not depend upon a new growth of the central stump of axis cylinder. Immediately after nerve section regressive changes appear in the distal part of the central stump (for about 0.5 cm. of its course).

The myelin sheath breaks down and the liberated fatty products stain the axis cylinders so that these give a faint reaction to osmic acid staining, before they also break down in their turn. Simultaneously, there is a coextensive proliferation of neurilemmal nuclei. At the end of each nucleus a cap of cytoplasm appears and grows out into an elongated fibril. In this way, fine nucleated strands of protoplasm develop, and the distal prolongations of the most peripheral of these grow towards the cut end of the nerve along the empty sheath of Schwann, and finally project from the cut surface to form the bulk of the soft scar tissue which unites the cut ends of the nerve. The development of these protoplasmic strands constitutes the first stage in regeneration. The second stage consists in the laying down, within each strand, of the axis cylinder with its medullary sheath. The rudiments of the new nerve fiber grow from the ends of the nuclei and meet similar rudiments growing out from adjacent nuclei. Where they meet and join the nodes of Ranvier are situated. Regeneration in the fully degenerated portion of the nerve below the section proceeds on identical lines, but is much slower and less profuse, since before restoration can take place the reestablishment of nutrition has to occur. Henriksen discusses the variations in staining reaction seen in new tissue, and the errors of interpretation made, in his opinion, by other observers, including Cajal, who do not take into account that staining reactions are extremely variable and unreliable. He objects that most histological investigations upon regeneration omit to consider the myelin sheath, which is an integral part of the new nerve fiber. He considers that the absence of degeneration in a nerve fiber, cut off from its cell body and preserved *in vitro* in plasma, indicates that Waller's law is untenable. He appears to have carried out no cultivation experiments himself, and it is probable that most of his conclusions would not be accepted by histologists nor by those engaged in cultivation experiments.

Salmon, A. BABINSKI'S PHENOMENON. [Rivista Critica di Clin. Med., April, 1921, Vol. XXII, No. 11.]

In this clinical study the relations of the Babinski reflexes to the superficial and deep reflexes and to the defense reflexes of Marie-Foix are studied. A case of anterior poliomyelitis is recorded in which a pronounced Babinski response was obtained, an observation already made by Medin in his classical contribution.

Burr, C. W. REFLEXES IN EARLY INFANCY. [American Journal of Diseases of Children, June, 1921, Vol. XXI, No. 6. J. A. M. A.]

Sixty-nine infants were examined by Burr, their ages varying from less than one hour old to ninety days old. The deep and superficial reflexes (*i.e.*, knee, Achilles, chin, plantar, abdominal) may be present at birth but the absence of one or all in early infancy does not indicate disease. The plantar jerk is very variable. It may be absent up to the third month

or longer, or there may be extension or flexion of the toes, or at one time there may be one movement, at another the other. Most frequently there is extension. The movement may be rapid or deliberate. The Achilles jerk is very frequently absent at birth. (How late in life it may appear is unknown.) Sometimes the abdominal jerk can be obtained only on stimulating the lowest third of the muscle. When the reflexes appear after birth, their appearance does not occur in any regular order.

Veraguth, O. NEUROLOGIC RESEARCH ON KINEMATIZED STUMPS. [Deutsche Zeitschrift für Chirurgie, March, 1921, Vol. CLXI, No. 6. J. A. M. A.]

Veraguth gives here the findings in six cases in which a large number of different functional tests were applied to the muscles and nerves in the tunnels through the stump. He says that the findings open new prospects for training coördinated muscular action, utilizing new synergisms and antagonisms.

Brun, R. REGENERATION IN THE NERVOUS SYSTEM. [Sch. Arch. f. Neur. u. Psych., 1921, Vol. IX, No. 1.]

A study from v. Monakow's laboratory where he states that complete serial sections of twelve apraxia brains are available for study. A number of other brains showed apparently identical conditions but there had been no or briefly transient symptoms of apraxia during life. He compares this material with clinical cases of apraxia and emphasizes what Henschen has always taught that regeneration or reëducation of the other half of the brain may change the clinical picture.

Hulst, J. P. L. ELECTRIC ACCIDENTS. [Neder. Tijd. v. Genees., September, 1921, Vol. II, No. 11.]

Three fatal electric accidents are reported in this paper in which death took place without burning. They are compared with four others with severe burning. The heat seemed to be responsible for the changes observed in all. Artificial respiration failed to resuscitate. He quotes Jellinek and Borutteau as ascribing the fatalities to fibrillation of the heart, and advising measures to combat this. He does not seem acquainted with van Gieson's studies on the minute cellular changes in the medulla.

Robertson, William. A CASE OF NERVE SUTURE. [Lancet, July 31, 1921.]

In 1897 a boy, aged eleven, fell from his pony, sustaining a compound fracture of the left humerus near the elbow. The boy cried out and a kaffir pulled the injured arm rather roughly. The sharp edge of the fractured humerus could be easily seen in the wound. No attention at the moment was paid to the enervation of the arm owing to the extensive wound in front of the joint and the setting of the fracture. The limb was put up in rectangular splints. The wound healed rapidly and early move-

ment could be practised. It was soon noticed that atrophy of the forearm and hand was too extreme to have been caused by the mere splinting of the limb, and sensation was bad in the fingers. One night the forefinger came accidentally in the candle and was burned without the patient being aware of it. After the wound was healed the bone united and the joint mobile. An incision was made over the median nerve some distance above the side of the fracture. Abundant cicatricial tissue was met with enveloping the nerve. After freeing the nerve from this the sheath was found to be intact, but on running the finger along a gap was observed indicating the complete severance of the nerve within its sheath, the gap measuring perhaps 2 or 3 mm. The sheath was cut through the gap, and when the two cut ends of the nerve were examined each surface was found covered with small oval bodies, the repair material of a severed nerve. No formed tissue existed between the ends of the nerve. The repair material was shredded off down to normal nerve fiber, and the two ends of the nerve were sutured through with fine silk. In opposing the ends the proper alignment of the nerve was observed. The nerve sheath was carefully stitched up. When the boy came out of chloroform, or shortly afterwards, with an exclamation of surprise he told me he could feel his fingers. He could also discern articles placed between fingers and thumb.

The wound healed by first intention. The splint was continued and for a few weeks gentle daily movement of the elbow-joint was all that was attempted. To the integrity of the nerve sheath is to be attributed the early functioning of the nerve cells. The arm since the operation has given no trouble and is now perfect in function and strength. No doubt the nerve was severed inside its sheath by the rough pulling on the arm at the time of the accident. [Author's abstract.]

Peugniez, P. BRACHIAL PLEXUS PARALYSIS FOLLOWING DELORME'S OPERATION. [Bull. de l'Acad. de Med., February 3, 1920.]

The author here reports a case of empyema following influenza in which Delorme's procedure of lung decortication was resorted to after the condition had existed for two months. The left lung was found retracted against the spinal column and covered with a thick fibrous layer. The temperature returned to normal on the fifth day and in six weeks the wound was healed, with the lung in good condition as shown by auscultation and the X-rays. On the day after the operation the patient showed a root paralysis of the left brachial plexus of the Duchenne-Erb type. There was anesthesia of the outer surface of the arm, from the acromion to the epitrochlea. Three days later, motor power began to return, and in somewhat over a month was completely restored, together with the sensory functions. The paralysis is ascribed to the fact that during the operation the author had to have the left arm drawn strongly upward against the head in order to be able to deal with the upper ribs beneath the scapula. The resulting rotation of the clavicle

about the sternoclavicular joint is believed to have compressed the brachial nerve trunks against the anterior tubercle of the transverse process of the sixth cervical vertebra.

Mackay, F. H. DIAGNOSIS OF PERIPHERAL NERVE LESIONS. [Surg., Gyn. and Obstet., December, 1921, pp. 646-650.]

From a series of 600 cases of peripheral nerve injuries, studied during the great war, the author offers some criticisms of the accepted teachings on the diagnosis of nerve injuries and makes a plea for a simpler classification of such lesions. Many of the signs, heretofore considered of diagnostic importance, were found to be misleading and, more often than not, served only to complicate the picture and confuse the observer. The classification of nerve injuries into clean-cut syndromes was, in his experience, impractical as signs of more than one syndrome were manifested in almost all cases. He believes that the simple differentiation of all nerve injuries into partial and complete physiological lesions is the practical and necessary diagnosis, as this decides the question of operative interference. Beyond the discovery of end bulbs there are no signs that may be taken as indicative of anatomical division. A consideration of the signs of motor paralysis is shown to present many difficulties to the examiner but these readily disappear if some fundamental rules are borne in mind. In the sensory field one is not justified in drawing any conclusion from the extent or degree of sensory involvement, while careful examination of the loss to pain and touch does not justify the conclusion that there exist two separate and distinct sets of nerve fibers underlying epieritic and protopathic forms of sensory stimulus.

He concludes that electrical reactions alone, as employed through the medium of polar change or the Lewis Jones condenser, offer little reliable information and are often misleading to the examiner, but that the loss of faradic response, coupled with the change in type of the galvanic response, from the quick, flash-like normal reaction to the slow, retarded reaction of a paralyzed muscle, is the surest and most reliable sign of the reaction of degeneration. Muscle atrophy is seen most intensely in partial lesions, particularly of the irritative type. Such phenomena as Huet's longitudinal reaction, Erb's paradoxical reaction and the incidence of pain and formication over the affected areas, are of limited diagnostic significance only. Finally, with all the signs of regeneration at one's disposal, there remains a definite percentage of cases where one is uncertain and, in these cases, time is saved for both patient and staff by early operative exploration. [Author's abstract.]

Paisseau, Schaeffer and Alcheck. MALARIAL NEURITIS. [Bull. d. l. Soc. Méd. des Hopitaux, November 18, 1921, Vol. XLV, No. 33.]

A clinical paper reporting a case in a young man who after a few days of pain in the arm developed paralysis of the deltoid. For four months it persisted with reaction of degeneration. No other instance of malarial

neuritis of the circumflex nerve is known to the authors. In nine of the thirty-seven cases of malarial neuritis the malaria was of the pernicious type. Sudden onset of the paralysis has been an almost uniform occurrence.

Blanc, Tsiminakis and Camino Petros. EXPERIMENTAL RESEARCHES IN HERPES. [C. R. Soc. Biologie, July 9, 1921.]

This serological study discusses the virus of herpes which he states acts like the rabic virus in being rapidly destroyed by bile. Unlike the virus of smallpox, it is insusceptible to the action of neutral red. An attempt to neutralize the herpetic virus with the serum of a rabbit immunized against it was unsuccessful; it was similarly found that the serum of a patient who had recovered from epidemic encephalitis was unable to neutralize the activity of the virus. No conclusions were, however, to be drawn from these facts.

Levaditi. VARIOUS ULTRA-VIRUSES OF NEUROTROPIC AFFINITY. [C. R. Soc. Biologie, July 23, 1921.]

This investigator here discusses his newer hypotheses concerning the ultra-viruses which he believes rise to encephalitis, herpes, rabies, poliomyelitis, and vaccinia. They may be grouped as follows: (1) They are all invisible filter-passers, they may all be preserved in the desiccated condition or in glycerin, they are destroyed at the same temperature, and *in vitro* they have only been cultivated in symbiosis with cellular elements. (2) They all have a distinct affinity for tissues derived from the embryonic ectoderm, such as the cornea, skin, and nervous system. For tissues developed from the mesoderm no special affinity is noticeable. The virus of vaccinia presents a constant affinity for the skin and the cornea and a variable affinity for the brain. The encephalitic virus may attack either the skin, the cornea, or the brain. The virus of rabies presents a special affinity for the brain, but can persist in the cornea or the skin. Finally, the virus of poliomyelitis offers no affinity for the skin or the cornea, but has a peculiar predisposition for the central nervous system, and more particularly for the gray matter of the spinal cord. In spite of the numerous properties which they possess in common, they each have a definite specificity of their own. The affections to which they give rise he proposes to call by the name of "ectodermoses." The skin and the spinal marrow stand at the two extremities of the scale of affinities manifested by these different viruses. It would appear that the greater the affinity acquired by a particular virus for the skin the less apt does it become for attacking the central nervous system, and inversely. From this point of view vaccinia is the least neurotropic of the viruses studied, while the virus of poliomyelitis is the most exclusively neurotropic. Encephalitis and rabies occupy a middle position. One can easily grasp the analogy between this neurotropism and that of the *Treponema*

pallidum. Here also, the more the germ is deprived of its dermatropic affinity, the more easily does it become acclimatized to the brain (general paralysis) or to the spinal marrow (tabes dorsalis), and vice versa.

2. CRANIAL NERVES.

Roger and Reboul-Lachaud. HERPES ZOSTER OF GENICULATE GANGLION. [Paris Médical, October, 1921, XI, No. 40.]

In this clinical paper the author reports a case of herpes zoster affecting the geniculate. Pain and an eruption in the ear, with the general symptoms of herpes zoster, facial paralysis and transient disturbance in hearing on that side were present.

Dragotti. SEASICKNESS. [Policlinico, February 16, 1920, XXVII, No. 7. J. A. M. A.]

Dragotti recalls that all movements of the body liable to sway the lymph in the semicircular canals may induce symptoms like those of seasickness. A cold or hot douche of the ear may not only produce the same symptoms but may arrest them when they have been brought on by the movement of the ship. Infants escape seasickness as their semicircular canals and the endolymph are not completely developed. Prevention and treatment of seasickness can aim, he says, only to reduce the excitability of the semicircular canal system, as we are unable to prevent the endolymph from being swung about. The bromids therefore, he declares, are the most effectual means in prevention, and strontium bromid irritates the stomach least of the various salts. Small doses are best, 1 gm. three times a day, beginning a week before going on board the ship and keeping it up during the entire voyage. Other sedatives might also be used. The labyrinth in time loses its extreme excitability. The same effect might be realized on land with the revolving chair or other means to train the semicircular canals to bear the swinging of the endolymph without reaction.

Benedict, W. L. RETINITIS OF HYPERTENSION PLUS NEPHRITIS [Jl. Am. Med. Assoc., June 3, 1922.]

Albuminuric retinitis does not always indicate an incurable disease of the kidneys or of the cardiovascular system. The essential features of the composite pictures that make up albuminuric retinitis, however, can be studied singly, in connection with the general vascular system and the kidneys. The nature and course of the retinal disease can be conveyed to the internist more accurately through a careful description of the fundus than by any term that cannot be defined fully. The single features which in their entirety compose the retinal pictures have a definite significance, and the association of groups of features gives the best indication of the processes that are active in their production. Vascular changes are present in varying degree in all types.

of retinitis, and form the logical basis on which can be erected a useful classification without reference to the still unsettled classification of nephritis. The character and amount of change in the vessel walls can be studied as easily as any other single feature of the retina. Benedict discusses a group of cases in which nephritis occurs late, and as a secondary factor probably follows that uncertain condition known as essential hypertension. The pathology of this type of vascular degeneration has been described by Gull and Sutton, but at the time their studies were made little was known of the influence of variations of blood pressure, and essential hypertension was entirely unknown. Whether the contraction of the small arteries is the factor which produces the high blood pressure or the high blood pressure causes the arteries to become thickened is an unsettled question. However, the blood pressure is raised in essential hypertension long before the contraction of the retinal arteries is noticeable. Also, persons having primary chronic nephritis will have high blood pressure for years without retinal signs until a definite renal break and retinitis of acute nephritis occur. It also is true that persons whose retinal arteries give evidence of the thickening that is seen in essential hypertension of long standing are found to have cardiac hypertrophy and not infrequently albuminuria, headache, dizziness and other symptoms of chronic nephritis, but the presence of nephritis in such cases is difficult to prove even by urinalysis, chemical blood examination, and tests for renal efficiency. The early retinal signs of hypertension sclerosis in the order of their appearance may be divided into two stages: (1) narrowing of the arterial reflex stripe and increased tortuosity of the arteries, loss of transparency of the artery walls, giving what has been described as a copper color, indentation of the veins which are crossed closely by arteries; (2) noticeable contraction of the arteries both in diameter and length (straightening out of curves and bends), deep indentation of the veins where arteries cross closely over them, disappearance of small arterioles, due to their contraction, appearance of minute white spots in the fundus scattered around the macular region without any particular reference to artery endings, and veins two or three times the diameter of the corresponding artery, and showing ampulla-form dilatation distal to the arteriovenous crossing. This constitutes the picture that is seen in persons who have progressive hypertension before any clinical or laboratory evidence of nephritis is found; these symptoms may continue for many years without any noticeable change in renal function. It is well known, however, that a severe break in renal function in a person who has hypertension will produce marked changes in the fundus, characteristic of acute nephritis, in addition to the vascular fibrosis. The picture is a composite one. The earliest noticeable additional changes consist of edema and hyperemia of the disk, and flame-shaped or lanceolate hemorrhage in the retina near the disk. Following this, edema of the

retina and areas of soft "cotton wool" exudate appear. If the blood pressure suddenly becomes greatly elevated, as usually happens with a break in renal function, the hemorrhages, edema and exudate will be correspondingly increased.

Macht, D. I., Greenberg, J., and Isaacs. EFFECT OF SOME ANTIPYRETICS ON ACUITY OF HEARING. [Jour. of Pharmacology and Exper. Therapeutics, April, 1920.]

This experimental study determining the effect of antipyretic drugs on hearing shows that sodium salicylate, acetylsalicylic acid, acetanilid, phenyl salicylate, and similar drugs decrease the threshold of hearing. Pyramidon, acetphenetidin, antipyrin and drugs of a related structural formula increase the threshold of hearing. Various combinations of synergistic and opposing effects are discussed in the text.

Aurand. THROMBOSIS OF THE CENTRAL ARTERY OF THE RETINA FOLLOWING OPHTHALMIC ZOSTER. [Lyon Méd., December 10, 1920.]

This is a clinical record of a case of a woman, aged seventy-five, who forty days after the appearance of ophthalmic zoster on the left side, suddenly lost the sight of her left eye without any preceding strain or injury. Ophthalmoscopic examination showed left optic atrophy and necrosis of the central artery without any retinal haemorrhages. The absence of any cardiac lesion enabled the diagnosis of retinal embolism to be excluded in favor of thrombosis due to endarteritis obliterans, the localization of which was due to the ophthalmic zoster.

Ginestous and Debédât. TRAUMATIC OPTIC ATROPHY. [Jour. de Med. de Bordeaux, Nov., 1920.]

Monocular blindness following trauma is here recorded. A boy hit his right frontal region violently against a tree. He lost consciousness and had bleeding from the nose. Radiography revealed no fracture of the skull. Vision in the right eye was completely abolished, the disc becoming white and atrophic. The authors diagnose a perineural hemorrhage leading to atrophy of the optic nerve.

Minkowski. ANATOMY OF OPTIC NERVE FIBERS. [Schweiz. Arch. f. Neur. u. Psych., 1920, VII, No. 2.]

This important anatomical research discusses the course, the terminals and the central representatives of the crossed and uncrossed optic nerve fibers in certain mammals and in man, and is here put on record for reference.

Cohen, Martin. SIGNIFICANCE OF PATHOLOGIC CHANGES IN FUNDUS. [J. Canad. Med. Assoc., June 3, 1922.]

A fundus diagnosis of chorioretinal arteriosclerosis, with or without edema of the disk, hemorrhages, whitish foci, etc., is a more tenable term

than albuminuric neuroretinitis. The basic pathology for the fundus changes in this study is a primary chorioretinal arteriosclerosis. The degree of arteriosclerotic changes found in the microscopic eye material is not in direct proportion to the amount of pathologic change noted clinically in the fundus. Ophthalmoscopically, no signs of retinal arteriosclerosis were apparent in some cases, though microscopically evidence of arteriosclerosis was found. The choroidal arteriosclerosis was more marked than the retinal. Also choroidal arteriosclerosis was present without retinal arteriosclerosis. The evidence of chorioretinal arteriosclerosis with definite edema of the disk, hemorrhages and whitish foci in the conditions designated as capillary sclerosis suggests that the kidney had already suffered marked contraction; on the other hand, the absence of the marked edema of the disk in these conditions is usually associated with a kidney which is the site of vascular changes alone. In the decrescent type of arteriosclerosis, the fundus frequently shows simply varying degrees of arteriosclerosis for a long period; in a small percentage of these cases, hemorrhages and glistening white spots appeared, rarely, edema of the disk. At times it is difficult or impossible for the ophthalmologist to diagnose a kidney or arterial disease from the fundus changes without the coöperation of an internist.

Müller, M. VISUAL DISTURBANCE AFTER HOT BATHS. [Münc. med. Woch., June 25, 1920.]

This interesting and apparently rare observation records two cases of serious disturbance of vision during or following hot baths. The patients were women aged sixty-five and eighty-four years respectively. In one case the patient was blinded while the electric bath was being carried out. She was completely blind for a time but vision gradually returned.

Heuer, G. J. INTRACRANIAL APPROACH TO CHIASMAL LESIONS. [Arch. of Surg., September, 1920. J. A. M. A.]

Heuer's experience is at variance with the views held by other surgeons. He says that from the standpoint of accessibility every chiasmal lesion excepting the portions of hypophysial tumors which have extended far behind the chiasm may be exposed by an intracranial route. Tumors entirely confined to the sella turcica (rare) or portions of tumors within the sella turcica are easily accessible when properly approached and are susceptible of removal. Tumors which have passed beyond the confines of the sella are not only accessible but their size and their operability can be determined. Cysts of the hypophysis are readily accessible, for they, as the solid tumors, appear forward and are as readily susceptible of drainage or removal as by the transsphenoidal approach. Suprasellar lesions are accessible, as are the true chiasmal lesions, tumors which cannot be approached by the nasal route. From the standpoint of accessi-

bility, Heuer says that an intracranial approach best exposes and can most adequately deal with the greatest number of chiasmal lesions; and that the transsphenoidal approach should be considered only in those early cases in which there are sellar headaches, but no neighborhood symptoms. The operation employed by him is fully described and well illustrated.

Maybaum, J. L. TWO CASES OF GRADENIGO'S SYNDROME. [Laryngoscope, March, 1920.]

Gradenigo's syndrome is characterized by an initial acute purulent otitis media, which may spread to the mastoid; intense pain in the parietal and temporal regions from involvement of the gasserian ganglion, and paralysis or paresis of the abducens nerve of the ipsilateral side. This syndrome occurring during the course of a middle ear disease or of an acute mastoiditis, before or after operation, is indicative of an intracranial extension. The two cases reported by Maybaum were characteristic. In one, two weeks after a simple mastoid operation, while the patient was making a satisfactory convalescence the syndrome developed. Recovery followed. The second had a history of an acute middle ear suppuration which had recovered. The syndrome had been present, with lessening severity, for a period of ten days; there was entire absence of signs or symptoms of mastoid involvement. Meningitis developed, to which the patient succumbed.

Crouzon and Béhague. CONGENITAL AND FAMILIAL OPHTHALMOPLÉGIA. [Bull. de la Soc. Méd. des Hôp., Paris, March, 1920.]

This is a report of a family in which there were from one to three members with pronounced ophthalmoplegia in each of three generations.

Gibson, A. TWO UNUSUAL NERVE LESIONS. [Surg., Gyn. and Obstetrics, December, 1920.]

In one of the cases cited by Gibson a piece of shell entered the right cheek and was removed by the stretcher bearer. The wound suppurated for a few days. No facial paralysis or even paresis resulted, and the wound, being satisfactorily healed, was ignored. Later the patient complained of twitching of the muscles of the right side of the face, with a tendency to lachrymation in the right eye when exposed to cold, to wind, or to bright sunshine. In addition to this, the skin on the right side of the face under the right lower eyelid, and at the root of the nose, was somewhat sensitive. He complained of a tickling sensation, this being pronounced even with a slight touch. By pressing his tongue against the buccal aspect of the upper lip and the right upper cheek he produced a tickling sensation in the face. Examination revealed a hole of some size filled in partly by scar tissue. This scar tissue involved branches of two sensory nerves: (1) the twigs from the infra-orbital branch of the maxillary division of the trigeminal, (2) the buccinator branch of the

mandibular division of the same cranial nerve. The irritation of this scar has produced heightened sensibility of other sensory branches supplying the conjunctiva, and this reflexly induced increased secretion of the right lacrimal gland along with motor irritability of the facial muscles which are closely associated with the trigeminal sensory distribution. The second patient complained of weakness of the left hand, been present for six or seven months and gradually increasing. He had had no accident, and no injury to the back, left shoulder region, or left upper limb. His occupation was that of a butcher. The electrical reactions of the muscles of the hand were normal both to faradism and galvanism. There was, however, distinct atrophy of all the interossei, and when full extension of the hand was attempted, some hyperextension was noted at the metacarpophalangeal joints, along with less complete extension than normal of the two distal phalanges, this condition being more distinct in the little and ring fingers. The appearance of the hand was that of the typical ulnar nerve lesion, though not in pronounced degree. What had happened was that the deep branch of the ulnar nerve, traversing the palm of the hand from ulnar side to radial just proximal to the heads of the metacarpals, was the seat of a traumatic neuritis, the result of direct pressure. [J. A. M. A.]

McMullen, W. H., and Huie, M. L. CHRONIC PROGRESSIVE OPHTHALMO-
PLEGIA EXTERNA. [British Journal of Ophthalmology, August, 1921.]

Three cases of chronic progressive *ophthalmoplegia externa* are here reported. Wilbrand and Saenger consider this to be a clinical entity. There is a gradual onset, usually in early childhood, of a bilateral, progressive paralysis of the external eye muscles, unassociated with other disease of the nervous system. The disease may have long pauses in its progress, but generally ends in complete external ophthalmoplegia. Ptosis is generally the first sign and diplopia is sometimes, but not often, complained of. Thirty or forty years may elapse before the disease is complete. The general health is not affected. Wilbrand and Saenger have collected thirty-two cases. The author's first patient is a man who began to suffer from ptosis at the age of eight years and at the present age of forty-two has the disease in well marked form. The second is a girl of eighteen years, whose condition has been improved with "orbital ridge" spectacles. The third patient is a girl, aged twelve years, whose blood failed to respond to the Wassermann test and who had no stigmata of syphilis. It is important to realize that in these rare cases there is no peril to life or risk of further serious organic disease.

Ziegler, S. L. OCULAR MENACE OF WOOD ALCOHOL. [British Journal of Ophthalmology, August, 1921.]

This author utters a warning against the dangers attending the commercial and industrial use of methyl alcohol, owing to its extremely toxic effects upon the system generally and upon the eyes in particular.

Its danger has been increased recently by its refinement, its cheapness and its unusual solvent power and for the United States by the Volstead Act. Methyl impurities are found in many articles in common use, such as bay rum, lilac and violet waters, quinine and other hair tonics, Jamaica ginger, vanilla extract, well known perfumes, foreign wines and soft drinks. It is sold pure as Columbia spirits, *Lion d'Or*, colonial spirits, Hastings's spirits or acetone alcohol. It is the basis of all so-called "burning fluids" for the chafing-dish and of the "anti-freeze" motor mixtures. No restrictions have been placed on its use and no warning has been given as to its dangers. The sale of articles containing this poison should be prohibited or regulated by insisting upon the display of a poison label stating that the use of this preparation by drinking, breathing or rubbing on the skin may cause blindness or death. The trades affected should be warned of the dangers of using wood alcohol to varnish tanks, closets or rooms in which the air is confined. The author supplies some details of the quantitative and qualitative tests for wood alcohol. The poison may enter the system by three avenues: ingestion, inhalation and cutaneous absorption. Examples of each of these are numerous. The ocular symptoms are not pathognomonic; blindness may be early, sudden and complete. There are seen sluggish, well-dilated pupils, scleral congestion, pain on rotation of the globe and occasionally paresis of one or more ocular muscles. The disc may be swollen to the extent of two diopters, or there may be marked pallor.

Milian and Périn. PARALYSIS OF ACCOMMODATION DUE TO ARSENOBENZOL. [Paris méd., November 12, 1921.]

This is a clinical record of a syphilitic woman, aged twenty-six, who, during the third series of injections of arsenobenzol, developed a crisis at the time of each injection with a large quantity of albumin in the urine and paralysis of accommodation. The albuminuria was explained by vasodilation of the renal glomeruli. Examination of the eye showed slight edema of the conjunctivæ, normal fundi, and myopia due to spasm of accommodation. The writers attribute the condition to involvement of the sympathetic, and suggest that all patients undergoing treatment with arsenobenzol should be systematically examined by an ophthalmologist.

Post, M. H. GLAUCOMA AND THE NASAL GANGLION. [Archives of Ophthalmology, July, 1921.]

In this review the older operation of section of the sympathetic ganglion, the author quotes the results in Widder's sixty-eight cases. The number of patients whose condition improved was twenty-six. It was temporarily improved in ten, stationary in seven and improved in twenty-six. In Rhomer's series of 114 cases, seventy-nine patients improved, twenty-nine did not improve and six became worse. As there

were several fatal cases the operation was abandoned. The nasal ganglion, also known as Meckel's ganglion, the sphenopalatine ganglion and sphenomaxillary ganglion, is situated in the upper portion of the sphenomaxillary fossa. It receives the majority of its afferent fibers from the superior cervical sympathetic chain. Thus, if nerve impulses are blocked at the nasal ganglion, the results should be similar to those produced by extirpation of the superior cervical sympathetic and the technique is less dangerous and difficult. Sluder has performed this operation in 2,000 cases with no bad results. A few attempts on these lines have been made in patients with increased intraocular tension and it seems established that intraocular tension can be affected by blocking nerve impulses at the nasal ganglion. With the use of cocaine and adrenalin the reduction of tension was 10 mm. Hg. for one hour. Injections of alcohol caused a drop of 15 mm. Hg. for ten days. This procedure carried out four days before operation will prove to be of value. [Aust. M. J.]

Terrien, F. RENAL RETINITIS. [Presse Médicale, August 24, 1921.]

This clinical paper first describes the usual appearances of a renal retinitis. The changes seen are edema of the papilla, small hemorrhages in the neighborhood of the papilla, white areas in the retina and the macular star. The area of the retina affected is generally limited to a region of three to five disc diameters, with the disc as center. The retina is considerably thickened to eight or ten times the normal by the edema and exudates. The edema is mostly in the intergranular layer, between the external and internal granular layers. Here also are the exudates, which are composed of fibrous clots which form the white plaques. The edema and exudates may be so abundant as to cause a detachment of the retina from the layer of rods and cones. This might be described as an intraretinal detachment and should be distinguished from the usual detachment when the remainder of the retina separates from the pigment layer which it leaves on the choroid, subsequent to the cleavage of the secondary optic vesicle. The albuminuric detachment is curable, should the retinal edema subside, contrasting in this respect with the classical detachment. The author does not agree with the German view that the retinitis is due to disturbance of the blood vessels. He believes that it is rather due to the failure of the elimination of urea. In many cases the classical picture may be wanting in certain features. There may be a retinitis without defective lesions, characterized by uræmic amaurosis, which is generally transitory and of cerebral origin; sometimes by the presence of central scotomata and rarely by alteration of the light and color senses. Another form is characterized by mild optic neuritis, without other changes in the retina. Rarely true detachment of the retina occurs and in some cases glaucoma. Atropine should be used cautiously in the examination of these cases. The prognosis is grave. Three fourths of the patients die within one year. The prognosis is

more favorable in pregnancy. The treatment is that of nephritis. Sometimes lumbar puncture is advisable. The injection of milk is strongly condemned.

Ginestous. CONGENITAL PARALYSIS OF THE RIGHT EXTERNAL RECTUS. [Gaz. hebd. des Sci. Méd. de Bordeaux, February 15, 1920.]

A girl, aged seven months, showed complete internal strabismus of the left eye. Ophthalmoscopic examination revealed slight hypermetropia, but no lésions were detected in the fundus. The infant's heredity and personal history were excellent, and no other abnormalities were present. Functionally strabismus could be excluded, and the condition was therefore congenital, being due to absence of the muscle, a vicious insertion, or a congenital abnormality of the centers of the external rectus.

Grant, Francis C. ANATOMIC STUDY OF INJECTION OF SECOND AND THIRD DIVISIONS OF TRIGEMINAL NERVE. [J. A. M. A., March 18, 1922.]

Injections into the second and third divisions of the *nervus trigeminus* have become a common procedure. The descriptions in the literature which various writers have given of the technic of injecting these two divisions of the fifth nerve may seem precise, when read, but are disappointing in their practical application. Any attempt to reach a nerve trunk lying deep beneath the skin, and emerging from bony orifices in the skull, requires definite landmarks and angles as guides to the approach. In the clinic with which Grant is connected, a zygometer is used, which helps in great measure to determine accurately the point on the face at which the needle should be introduced to reach a particular nerve trunk. Using this instrument to standardize the points of insertion of the needle through the skin, the angles in the horizontal and vertical plane through which the needle must pass from this fixed surface point to enter the nerve trunk have been worked out. The details are given.

Turner, A. L. PARALYSIS OF THE VOCAL CORDS. [Journal of Laryngology and Otology, August, 1921.]

During twelve years this observer has seen six patients suffering from paralysis of the vocal cords due to pressure on the recurrent laryngeal nerve as the result of glandular enlargement consequent on malignant tumor of the breast. In each instance the breast and the axillary glands on the side of the tumor had been removed. In one case the condition was a melanotic sarcoma, in the others a scirrhus cancer. Hoarseness developed at varying periods after removal of the tumor, after eight months in the case of the sarcoma and after an average of three and a half years in the others. The paralysis was homolateral (right) in four cases, including that of the sarcoma, and contralateral in two cases. In the scirrhus cases the supraclavicular lymphatic glands

were found secondarily involved at the time of the laryngeal examination, occurring homolaterally in four cases and contralaterally in one. In the case of the sarcoma no glands were palpable. Turner shows that the supraclavicular glands form an important link in the lymphatic chain, along which the cancer cells disseminate, and that in all probability they do not exert pressure directly upon the recurrent nerve in the neck.

Chance, B. NEUROPATHIC KERATITIS. [Arch. of Ophthal., November, 1920.]

A man, aged forty-five, suffered from keratitis. He had had left-sided trigeminal neuralgia and resections of the supraorbital and infraorbital nerves had been performed without relief. Alcoholic injection into the Gasserian ganglion had been done and for two years he was free from pain. The cornea was edematous, without brightness and pervaded by fibrillary scars.

BOOK REVIEWS

Stout, Charles Tabor. THE EIGHTEENTH AMENDMENT, AND THE PART PLAYED BY ORGANIZED MEDICINE. [Mitchell Kennerley, New York.]

This book originally started as a piece of political campaign propaganda. The author believes it accomplished its aims in deleting a presidential candidate from the running. Its continuation has for its avowed object the desire to call attention to the "real meaning of the prohibition movement, and its relations to Organized Medicine and other interests. Under the guise of altruism, a grave injustice has been imposed upon a free people by a relatively small number of zealots and profiteers. It seems important, therefore, that the public should know the facts."

The author then makes an effort at tracing the sources of the "anti-alcoholic propaganda." He first runs it into the camp of the "American Medical Association acting in coöperation with the medical departments of the national government," which he assumes is attempting a renewal of the "inquisition of the Middle Ages." True, a new type of rack and fagot, of peeping and prying, has resulted therefrom but the history of this movement in the Middle Ages is being repeated in the Prohibition Movement.

This is the thesis. How about the argument? The "Issue" cannot really be touched by the courts. The "Moral Plea" fails. The United States is now one vast brewery of bad liquor. Prohibition, far from helping the morals of the people, has increased hypocrisy, and the vilest scum of the community, united by graft and bribery, floats triumphant on the surface, like the active yeast in a mash of rotting corruption.

The "Health Plea," Chapter 3, deals with the alleged coalition of the American Medical Association, the Life Insurance companies, and the Standard Oil Company. The cost of labor is here the fulcrum of other large corporate interests which are included in the coalition. The American Medical Association is held up as a vast machine to help the inside cliques and factions and put the rank and file of the profession on the "black list" if they are not content with obedience and acceptance of the orthodox opinions of the "insiders."

To which the reviewer after thirty years' experience with the American Medical Association, its magazines and activities, says, in the language of the whole controversy, "Bull!"

The American Medical Association, officially, has done many stupid things, it is our humble opinion, but that it is to be summed up as the author has attempted in his fourth to eighth chapters is, we believe, rubbishy paranoid thinking. The worst fault that can

be laid against the American Medical Association, chiefly represented in its Journal, is a certain dogmatic and limited series of concepts concerning the mechanisms of the human body, which after all are but true reflections of the phases of scientific medicine struggling to obtain better concepts for the control of disease. "Knowledge runs but wisdom lingers." Certainly the Journal has spread abroad more of what we call "knowledge" than any other vehicle in the medical field in the world. It cannot be expected to rise above its sources. Wisdom will be gained in time, but to attempt to belittle so useful an agent as the Journal in the dissemination of "knowledge"—even though, like all knowledge it ceases to be such in time—is to cut off one's nose to spite one's face. A characteristic type of psychotic reaction.

The author then takes his fling at the "Life Insurance Companies and Alcohol and Longevity." Much of interest and of profit is contained in his discussion, but the valuable parts of the argument are spoiled by the inclusion of his fixed idea. To assume that in order to sell "petroleum" compounds for constipation, the Standard Oil Company's inner motives are laid bare is enough to make a horse laugh, again reverting to the vernacular. While it may be a personal opinion that constipation is, as a universal disorder, better treated by understanding more about personal hygiene, especially mental hygiene, than by laxatives the remedy is to train the profession and thus the people to understand such hygiene better, and not to construct such paranoid mares' nests about the collusion of the interests mentioned by the author.

It is a pity, in a sense, that the author loses the kernel of his truthful feelings about questions of personal liberty and the machinery of a movement, such as the Prohibition Movement. The whole problem of the psychological aspects of alcoholism is practically neglected. It is true that the people are as yet unable to get at this very intricate situation. Prohibition may be a way of learning about it—racially. We are in the growing pains period. A social stream of filth and pus arises in the workings of the movement. We shall learn something about this as well. It may be a tornado, or merely a trickle. Statistics is still but an adolescent science. At all events, while the present filthy profiteers may be buying all the diamonds and pearls and sables in Fifth Avenue, Bond Street, or the Rue de la Paix, who can say what ultimate values may be put upon jewels and furs as contrasted with moral character?

Certainly this brochure does not stress these things. While it cuts and says some smart and it may be some true things, it does not contain that calmer judgment which will make it a great help in solving an almost insoluble problem.

Saussure, Raymond de. LA MÉTHODE PSYCHOANALYTIQUE.
[Libraire Payot et Cie, Lausanne et Genève.]

This modest volume, with a delicate and well merited commendatory preface by Freud, is one of the first sincere efforts in French

literature to adequately present the Freudian concepts. It is true that Flournoy has appreciated the work of Freud and has lectured in Geneva upon the psychoanalytic researches, and also has published extensively, but in general, apart from some studies by Jung and Maeder, the French literature on psychoanalysis has been conspicuously absent.

A distinct awakening in interest in this movement is now apparent in France, Freud's original works are being translated and this very estimable volume is another evidence of this interest.

It possesses a rare simplicity and directness of statement and a unique and pleasing appreciation of the main points of development of the psychoanalytic technique.

For the most part it is an exposé of the Freudian principles, but it also contains some original matter, notably in two chapters, where Dr. Odier of Geneva has given a dream and its associations and the author presents an analysis of the same illustrating the dream mechanisms as outlined by Freud.

The book is remarkably well written and makes a valuable contribution to the serious literature of psychoanalysis for beginners.

Kretschmer, Ernst. MEDIZINISCHE PSYCHOLOGIE. [George Thieme, Leipzig.]

This coming neuropsychiatrist from the "Tübingen Klinik," who has given us a series of interesting and original papers on the relations of the endocrines to bodily and mental development, on problems of clinical grouping, and on the symptomatology of the psychoses, here presents a short "Leitfaden für Studium und Praxis."

The need of students of medicine for a greater understanding of mental processes has become manifest everywhere. Heretofore their complexity and subtlety has caused the well known defense reaction on the part of the general profession of either ignoring them entirely or of treating psychological topics with an ironic ridicule. But matters that are so vital in the human machine cannot be set aside by such or other modes of attempted neglect. Practical results are demanded by suffering individuals and they were not to be obtained from those unskilled in the functions of the intricate machinery of thought and feeling.

Academic psychology was sterile by reason of its artefacts, and only with the advance of a truly behavioristic psychology, a revival of the old Heraclitian, Protagorean disciplines of exact observation, has the psychology of our universities been of any service to the student of human nature.

Intellectual psychologies have been too onesided and it is fortunate that in the little work under consideration the broader aspects of feeling have been incorporated and a fuller picture of the mental functionings been presented.

This is done in five chapters, respectively entitled: The Soul and its Developmental History; The Soul Mechanisms, here grouped under the "hypnoic" and "hypobulic" mechanisms. Under the

former the author discusses the functional activities of the dream, the hypnoid states, schizophrenia and expressionism, free associations and apperceptive thinking. Under the latter are to be found descriptions of rhythmic movements, movement storms, panics, and dissociated activities, negativism, suggestion and displacements.

Chapter III discusses the Cravings and Temperament. Here are included (a) nutritional cravings, protective instincts, and sexual instincts, their developmental history, their stages, repressions and their energy substitutions; (b) temperament and body form, cyclothymic and schizothymic types. This is an excellent condensation and generalization of the author's well received study on "Körperbau und Temperament."

Personality and Reaction Types are discussed in his next chapter. Here the author discusses a large number of recent studies on human behavior as seen by students of disordered conduct.

The final chapter deals with Practical Medical Psychology. Inasmuch as American jurisprudence has not advanced into a scientific stage, this chapter is of more medical than legal value. It offers many valuable suggestions for clinical neuropsychiatric examination.

On the whole this *vade mecum* is an excellent one and could be made the basis of an extremely valuable neuropsychiatric semiology.

Shuttleworth, G. E., and Potts, W. A. MENTALLY DEFICIENT CHILDREN, THEIR TREATMENT AND TRAINING. Fifth Edition. [P. Blakiston's Son & Co., Philadelphia.]

It is nearly twenty years since the first edition of this excellent small manual was reviewed in the JOURNAL. Its successive editions have increased its value and now in its fifth edition, much revised and enlarged, and with additional material, it represents one of the most standard and trustworthy volumes devoted to the subject.

Benon, R. ELÉMENTS DE PATHOLOGIE MENTALE. [Octave Doin, Paris.]

In the preface of this small volume of 240 pp. Balthazard, professor of legal medicine of the University of Paris, tells us it is the result of the author's general discussions on psychiatric and medico-legal subjects during a four year internship at St. Anne and ten years later spent as physician to the psychopathic wards of the General Hospital at Nantes. Four years of war experience has also enabled the author to correlate this material with that of his previous activities.

Psychiatry is here presented as a medley of syndromes rather than of separate disease entities.

He begins with a short, clear set of semiological considerations. Sensations, ideas, illusions, hallucinations, delusional interpretations, emotions, passions, activity, these are in turn discussed as the foundations of an examination of happenings in the field of psychiatry.

His next chapter deals with delusional formations, the delusions of persecution being given as a type. Other forms such as the

delusions of grandeur, of impoverishment, hypochondriacal delusions, mystic delusional ideas, these are described. Delusional thinking on a basis of hallucinatory experiences, and acute delusional formations and chronic systematized delusional thinking are also described briefly. Some few words concerning the prognosis of the delusional syndrome is given. Too few, almost, to satisfy the present requirements.

In a manner similar to that in which the topic of delusional syndromes is discussed Benon now takes up in turn: The Dementia Syndromes, Paretic Dementia, Dementia Praecox, Senile Dementias, Organic Dementias; these are briefly characterized, differentiated, prognosed, and treated. Then the Mania Syndromes; Mental Confusion Syndromes; Korsakoff's Syndrome; Constitutional Mental Defect States; Constitutional Emotional Disturbances; Obsessions; Aphasia, Agnosia and Apraxia; Secondary States, double personalities; Epilepsy and Hysteria; and a final short chapter on medico-legal problems.

It is a handy little book but without any particular idea in it. We doubt if the student is really benefited any more than if he should study headaches, jaundices, diarrheas, oedemas, paralyses or vomitings as syndromes in internal medicine, and be taught to think of them as anything more than symptoms grouped in some essential syndromy with a certain coherency concerning their essential causes, morphological foundations, and clinical course. In this lack of an organizing synthesis, even in point of view, the little work fails to stimulate. It only reiterates.

Williams, Edw. Huntington. OPIATE ADDICTION. ITS HANDLING AND TREATMENT. [The Macmillan Company, New York.]

This is the first book of this kind we have seen which gives evidence of common sense associated with an intimate knowledge of the situation.

In his introduction Williams draws an excellent parallel between the legal efforts made to stop narcotic taking and those which former generations took to stop "insanity." The days before Pinel saw all kinds of complex legal and religious machineries attempting to prevent people from becoming "insane." Such "possession by devils" could be stamped out if there were enough officials to do it.

Fortunately Pinel and his followers put the problems of mental disease in an entirely new light, and although legal and religious interferences still persist, they are more in the nature of atavistic ideas than corporal supervisions.

In 1914 the Harrison Narcotic Law was passed and it is a practical failure. A new bureaucracy has arisen, costly to the taxpayer, a power to the politician, and of little service to change a situation, because, like the "insanity" of the Middle Ages, the causes are little comprehended and hence the remedies proposed are found to be useless in their present forms. Perhaps so footless a measure as the Harrison Act may lead to a better understanding of the reasons for drug taking.

In matters of treatment the author follows along conventional lines. Slow reduction and rapid withdrawal are both discussed solely on the static side. The inner psychological situations are not revealed. In fact this is the weak point of an otherwise excellent book—the unconscious factors which produce the most difficult cases are not touched—otherwise it is readable and practical.

Eyre, Mary B. PSYCHOLOGY AND MENTAL HYGIENE FOR NURSES.
[The Macmillan Co., New York.]

The nurse's work in mental hygiene is of paramount importance. We are inclined to rate it above that of the physician, in that the contacts with the sick individual are more constant and for the most part more fundamental.

Since it is daily becoming more apparent that psychological factors are practically always present in the great majority of so-called physical diseases, and that a clearer recognition of them, chiefly as laying the foundations for after coming disease possibilities, the nurse occupies a highly important position. She can do better work if equipped with a knowledge of more fundamental psychological principles, and this is the object of this book.

In a clear, straightforward and essentially human manner she then discusses in this primer such topics as Habit Formation, Consciousness, Sensation, Instinct and Emotion, Attention and Memory, Reason and Will, Psychology of Childhood, the Subconscious, Life Force and Human Behavior, Mental Hygiene in Public Health Nursing, Psychology of Nursing, Psychology of Occupation, and the Binet-Simon Scale.

The little book is exceeding well done. We know of no other work which has as much good stuff in it which if intelligently read will lead to an extremely helpful force in the nurse's attitude towards all kinds of nursing problems.

Brill, A. A. FUNDAMENTAL CONCEPTIONS OF PSYCHOANALYSIS.
[Harcourt, Brace and Company, New York.]

Brill, A. A. PSYCHOANALYSIS. ITS THEORIES AND PRACTICAL APPLICATION. Third Edition. [W. B. Saunders Company, Philadelphia and London.]

The latter of these two volumes is well known. The first edition appeared in 1912 and was at once recognized as the first authoritative reproduction in English of Freud's new discoveries in the field of human psychology—discoveries which now after some thirty years have given a new mode of approach to all types of psychological problems, even though they lie apparently outside the practical field of neuropsychiatry.

Dr. Brill's Psychoanalysis has grown considerably since its first edition, and now in this new third edition is a book of 470 pages dealing with most of the practical aspects of psychoanalysis in psychotherapy, as well as affording a large comprehensive grasp of the ideas underlying the analysis of the unconscious.

The new chapters added to this edition are of special interest to

the neuropsychiatrist. That on "Paraphrenia"—Kraepelin's partial split-off of certain "dementia precox" cases offers an example of what the newer psychoanalytic methods have to offer in the understanding and treatment of certain chronic psychoses, heretofore dealt with as pernicious and incurable.

His chapter on Masturbation is also an excellent exposé of a difficult problem. The average individual, lay or medical, cannot free himself from the purely gross material act performed in a waking state under full consciousness as constituting masturbation. Psychoanalysis has shown that this is the least frequent type of masturbatory activity—although it may be recalled that at some period of life nearly every human being has carried out this act in the narrow sense just outlined. It is the unconscious masturbatory activities which play so large a rôle in the neuroses, and practically only the psychoanalytic technic can uncover these.

Other new chapters have been added to this excellent book making it a new volume; the older material has been revised and the whole book rounded out so that a really representative exposition of Freud's views is afforded—as well as an elucidation of the situations described through excellent case material of the author's own—these together make the work one of great merit and service to the community—for by means of the principles herein expounded—many sick individuals in the community may be benefited, as by no other mode of therapy.

In Brill's *Fundamental Conceptions* we have a new book. It grew out of a series of lectures the author has been giving in the New York University upon the subject of Psychoanalysis. Inasmuch as his audiences were not medical the subject matter has been presented in a somewhat different manner—in that the therapeutic aspects in medicine are less prominent and the "know thyself" human aspects of the early Gnostics has received his chief consideration. Hence this work would set forth what the Freudian hypotheses have contributed in the way of our understanding of human behavior. It deals with educational and psychological aspects of conduct. Pathological material is freely used in illustration, but it is here employed as serving to elucidate a knowledge of mental mechanisms, rather than a study of diseases.

Brill traces the development of the principles of psychoanalysis through the Cathartic Method; he then discusses what is meant by "symptoms" in the neuroses and thus enters into the dynamic aspect of the human machine, to the understanding of which Freud has so richly contributed, since the sterile, descriptive, static aspect only heaped up a lot of "what's," but never gave us a satisfying "why."

The "Psychology of Forgetting," "The Psychopathology of Every Day Life," "Wit and its Technic," "The Dream and its Functions," "Types of Dreams," "Common Forms of Insanity," "The Only Child," "Fairy Tales," and "Selection of Vocations"; these are the chief chapter headings in this very readable and excellent volume.

Stoddart, W. H. B. MIND AND ITS DISORDERS. Fourth Edition. [P. Blakiston's Son & Co., Philadelphia.]

In our review of the third edition of this work published only a year ago we spoke of it as the most progressive, if not the only manual worthy of serious consideration on mental disorders published in England in the past five years. Our opinion was not based solely upon the fact, which Stoddart had the courage to announce in his preface to the third edition, that he had come to realize that without an utilization of Freud's views, the older descriptive psychiatry was dead. It was much informed, and meticulously detailed, but it had no life in it. It was no better than a Ford illustrated price list of the parts of his machine. The newer psychiatry was infused with purpose and values and dynamic concepts made the machine run. Stoddart has progressed along these lines and his new edition is a better one than the old.

We note that Exophthalmic Goiter is placed in the "Anxiety Neuroses." In our last comment we dissented somewhat from this left-over of the older pedagogic habits to pigeonhole things. There are Exophthalmic Goiters which undoubtedly are best explained as the expression of an anxiety neurosis mechanism—but there are others which are fundamentally related to toxic thyroiditis, which has nothing to do with an anxiety neurosis. Adenoma of the thyroid may fundamentally be of psychogenic origin, but there are not enough analyzed cases to be dogmatic about it. The writer of this review has recently seen one syphilitic thyroiditis with Exophthalmic Goiter, and one of Graves' Disease in Epidemic Encephalitis. Whereas we are inclined to believe that it has in the past been great stupidity on the part of the internist to overlook the psychogenic causes for Exophthalmic Goiter, it can be equally foolish to gather them all in the psychogenic fold, even though it is the reviewer's belief that perhaps 80 per cent are primarily psychogenic and for the most part amenable, in early stages, before they have been frightened to death by clumsy medical tactics, to an adequate psychotherapy.

We also agree with Stoddart in the placing of the epilepsies among the psychoses, but the newer dynamic psychopathology is demonstrating that hard and fast lines mean little. Dynamisms are not concerned with classifications, much as they are needed in intellectual efforts. This distinction clearly grasped, the phrasing of many of the author's statements could be altered to include this dual aspect of reality, so frequently made the basis of ineffectual conflict between opposing facets of truth.

We welcome the new edition and wish it the success its predecessors have so well earned.

Parker, G. H. SMELL, TASTE, AND ALLIED SENSES IN THE VERTEBRATES. [J. B. Lippincott Company, Philadelphia.]

The monographs on Experimental Biology have had added to their number this new contribution from Professor Parker of Harvard, who already has enriched the series by his delightful work on The Elementary Nervous System.

He here passes on to another aspect of neuropsychiatric interest and presents us with an analysis of Smell and Taste primarily, and then discusses some questions of interrelations of the senses, based upon his nutritive group of receptors. After a short, slightly biased description of the older views of the sense organs, Parker outlines the origin of the term *receptor* and the reflex arc hypotheses. As to what enters into cortical activities—here only conceived of as *conscious sensation*—he is somewhat academic. *Activators* is the name given to those receptors whose caught impulses are supposed to be incapable of being consciously perceived. Of course what is meant by sensations, and conscious perception? Is it all a matter of degree, or of kind? Dynamisms are interested in degrees, intellectualisms with kinds. In his efforts to be very careful and say that coelenterates do not see, but are stimutable by light impulses, one sees a meritorious caution, but is it necessary?

The Anatomy of the Olfactory Organ, Physiology of Olfaction, the Organ of Jacobson, as containing subsidiary olfactory receptors, the Common Chemical Sense, Anatomy of the Gustatory Organ, physiology of Gustation, Interrelations of the Chemical Sense, these are the subjects which Parker discusses in so entertaining and yet careful a manner.

We had wished he might have said more about the chemical receptors of the gastrointestinal canal, or possibly the chemical receptors found in such organs as the thyroid, the pancreas, the hypophysis, etc. Here is a wonderful field of investigation, for in some manner or other about twenty-eight chemical substances have become integrated in the human body and constitute the actual materials by which or through which the stimuli pass on to action—the chemical foundations of transformers of energy, by which action becomes possible. When more is known concerning these chemoreceptors we shall be nearer to knowing something about hayfever, rose cold, horse asthma, protein sensitization and similar crude reactions—*i.e.*, about the receptor side—the transformer and effector sides, however, are even more intricate and all pathways have cortical association areas. The student of unconscious processes is slowly learning that “organ representation” is more subtle than “conscious perception.” Whether a coelenterate can see or not may be a matter of definition, but we are convinced that the author’s criteria of “sensation” are valid ones.

This is one of those interesting books that adds new material to integrate into the neuropsychiatrist’s store of knowledge. Like nearly everything Parker gives us it is interesting and stimulating.

Crile, G. W. et al. THE THYROID GLAND. Edited by Amy F. Rowland. [W. B. Saunders Company, Philadelphia and London.]

This is an extremely interesting book detailing largely the work done in the Crile clinic. It is written by Crile and his associates. It is on the whole highly valuable but in certain respects it seems

inadequate. The surgery is exemplary; the philosophy faulty—without a proper blending we cannot get good medicine.

What do we mean by the faulty philosophy?

We are told that "Environment drives the brain." We will agree to this in a sense; "The brain drives the organism," also this; "The driving power of the brain depends principally upon three organs: the adrenals, the liver and the thyroid. This we consider rubbish.

The organism "as a whole" is absolutely essential. Nature has been building it one thousand million years and if all we needed was "adrenal, thyroid and liver"—why then that's all we would have after one thousand million years of trial. As well tell a man with a Rolls-Royce he could get along with a wind shield, a pair of tires, and a monkey wrench. Perhaps one might throw in a motor, a carburetor, and an oil can, and Rolls-Royces are to the human machine, in point of complexity of structure as tools, as a hammer is to a transatlantic liner.

The idea that we can pick out in the human body this or that organ, say a handful of them, and throw the rest away as serving no function, is, we respectfully suggest, unworthy of the simplest intelligence.

A little further on we find it is all "*iodine*." What about the other chemical structural possessions in this integrated machine called man? What about calcium and the parathyroids; the lungs and oxygen; the hypophysis and phosphorus; the iron, and manganese, and the sulphur? Don't they do anything? Drop out sulphur or phosphorus and see what we could do in building up the fats, and so on, and so on, through a million chemical metamorphoses which take place in the proteid molecule, *all of which* are essential to running the machine—*i.e.*, essentially run it.

No! Dr. Crile's philosophical formulae are entirely too simplistic and naïve. He has not grasped, or here shows no evidence of it, that unless one discusses the organism as an integrated mechanism they are not thinking in true physiological terms. We are quite content with his surgical mechanics; but as to his functional explanations they are unsatisfactory.

Pierce, Frederick. OUR UNCONSCIOUS MIND. [E. P. Dutton & Company, New York.]

From many sides it is becoming increasingly evident that technical medical science is receiving more and more intelligent attention from the layman.

In matters psychological, concerning which theoretically the scientifically trained mind alone should be capable of understanding its amazing intricacies, it has seemed from the very beginning of the intellectual life that the doctor was at a serious disadvantage with the layman, and that inspiration, divination, or what not, had revealed more of the secrets of those intricacies than had all the iron, brass or glass instruments of the dissector, the measurer, the alchemist or chemist.

The doctor has been poking around in his specialistic pots too much, and has been forgetting that which makes an organism work as a whole, namely, the machinery that binds it—*i.e.*, its psychological functions, acting through those structures known as the nervous system.

It is no wonder, then, that with the manufacture of a new set of analytical tools, which could carry on the old sophists' investigations into the subtleties of organismal behavior, that they were seized upon by the masses ever with greater avidity than by the medical man himself. They had fewer prejudices to overcome, less obstinate pride to confess to failures, and fewer of the facts so laboriously thrust into the memory and which soon became out of date, to get rid of than had the medical man. Hence the great popular appeal in this field made available at greater depths by the genius of Freud, and hence this layman's effort to tell something about it.

Undoubtedly the layman will really get more out of this work than he would from the more ponderous and one-sided volumes along similar lines written by medical men. For it is not only well written, but in general the author has grasped the essential features of the implications of the Freudian hypotheses. He has taken them as hypotheses as Freud himself modestly states them to be, and has tried them out for himself and then told others about it.

In the mass of layman's literature on this subject, much "incompetent and unauthoritative," this book of Pierce's stands out as a piece of meritorious work. It is stimulating and will lead the public to want to know more and that puts it up to the medical man to really get on his job and understand the machine he is called upon so incessantly to repair and do it understandingly. There are those who deprecate infringement in the medical field. We are not among them. Any group, or sect, or profession that is unable to stand up against the inroads of competition is not worth much. The medical profession must conquer through its increased efficiency in doing its work. It will die the day it becomes a closed corporation and shuts out the public. This is the law of life and of creation. We welcome this book as aiding the medical man both directly and indirectly. If he has done nothing with the newer psychology—this book will help him. If he has, this book, because it sharpens up his clientele, will in turn rouse him to greater efforts to cure a host of disturbances in the human machine which have been neglected, because "human," until they cause physical disease; and they are largely hopeless.

Glaessner, R. DIE PROBLEME DES GESCHLECHTSLEBENS. [Anzengruber-Verlag, Brüder Suschitzky, Wien, Leipzig.]

The love of man and woman, or love, happiness and marriage, will always be subjects to write upon. A "well meaning study for the adult female" is the author's subtitle. In 37 pages a few general remarks which deal with the erotic impulses at deeper levels than those usually written about. It seems a book half way between the old static ideas of sex and marriage and the newer revelations con-

cerning the "determinism" of the creative impulse and the ethical imperatives which have grown up about it in order to maintain its prepotency.

Patten, William, Ph.D. THE GRAND STRATEGY OF EVOLUTION. [Richard G. Badger, Boston. 429 pp.]

It would be difficult to agree with all Patten has to say and dangerous to disagree. There is always small chance that in a book of this size a germ of truth may unwittingly creep in. To reform the world and its maze of intricate functionings from a laboratory biological point of view is always a dangerous business. The simplicity of the idea is very appealing but it is of a simplicity which tends to confuse and trap us into a sense of security which has no foundation in reality. [Stragnell.]

Vanden Bergh, Leonard John. ON THE TRAIL OF THE PIGMIES. [James A. McCann, New York.]

Many facts are recorded in Father Vanden Bergh's notes on the Wanyika, Karrondo and Wanyika which should prove of value to the ethnologist. There is a paucity of literature on these tribes and the observations should be of special value as Vanden Bergh had no preconceived ideas so frequently encountered in the "trained" observers. There are many psychological traits which are mentioned which are of interest to the student of modern psychology which bear out the taboos and rituals so completely described by Frazer and other workers. The photographs are excellent and the work on the ordinarily inaccessible pigmies worthy of careful consideration.

Of interest is the description of the sexual life and cultural development of the highly developed tribe of the Masai.

On the whole we have presented the life of several African tribes in a popular yet exact fashion from a most human angle. [Stragnell.]

Jansen, Murk, O.B.E. FEEBLEMINDEDNESS OF GROWTH AND CONGENITAL DWARFISM WITH SPECIAL REFERENCE TO DYSTOSIS CLEIDOCRANIALIS. [London, Henry Frowde, Oxford University Press, Hoddle and Stoughton, Warwick Square, E. C. 4. 1921, p. 82.]

Jansen's former translation *On Bone Formation: Its Relation to Tension and Pressure* (Manchester University Press, 1921), showed him a serious student who arrived at his conclusions in a simple yet ingenious fashion. In his present monograph on Feebleness of Growth he makes use of clinical material familiar to medical practitioners and formulates new concepts which are worthy of consideration. Family groups are studied and certain biological rules formulated. In cases where no specific infections can be assigned to the causative factor the first children being overgrown, *i. e.* the child "has outgrown his strength"; in children 2, 3 "the growth cartilages normally have a reserve power of growth" and in child 4 there is no "reserve power of growth," while in children 5 and 6 there is a distinct retardation of growth where the muscles and all skeletal

parts have been affected. He contends that pressure is an important factor in growth retardation. This may be a correct interpretation from the viewpoint of physics, but does it answer the more important question as to what causes these initial pressure changes? The present approach to the topic is full of interest and worthy of a more complete development. Of interest is the author's consideration of the topic of growth as a functional manifestation. The reading of his works should tend to stimulate other workers in this field and his findings could well be applied to other metabolic changes and growth manifestations. [Stragnell.]

Mitchell, T. W. THE PSYCHOLOGY OF MEDICINE. [Methuen and Co., London.]

Dr. Mitchell presents us herewith an exceedingly well written, conservative and painstaking résumé of the body of principles and applications of the present day trends in psychopathology and psychotherapeutics.

It is written really for lay audiences, and deals mostly with the general features of the newer psychoanalytic movement. Of this he has presented a well rounded and acceptable sketch, which is neither too dogmatic, apologetic, nor controversial. It is a sober, sane and valuable book and can safely be recommended to lay readers who would know more of the Freudian principles.

Jolly, Ph. KURZER LEITFADEN DER PSYCHIATRIE. Zweite, vermehrte Auflage. [A. Marcus and E. Weber's Verlag, Bonn.]

In some 260 pages the author has compressed an excellent didactic presentation of descriptive psychiatry. It is along orthodox lines; is deliberately static, but carefully and intelligently worked out.

Christiansen, Viggo. CHARLES BELL. [Masson et Cie, Paris.]

Bell has always been an attractive historical figure. "Bell's Palsy" stands out as one of his syntheses with which all are familiar; but his genius as an innovator is rarely appreciated.

Modern neurology is hardly a century old. The ideas of the end of the eighteenth century are realized but by few and were, for the most part, "all wrong." Bell was one who really instigated what is now called "modern neurology," and it is of interest to note that this charming little brochure, written by one of our most active and cultivated colleagues of Copenhagen, has placed this English neurologist where he really belongs.

This delightful historical study is well worth the having and the author is to be congratulated for its charm and freshness.

NOTES AND NEWS

Prof. William Weygandt, M.D., Ph.D., Professor of Psychiatry in the University of Hamburg, and Director of the Hamburg Psychiatric Clinic of Friedrichsberg, Hamburg, made a short visit to the United States, Oct. 24 to Nov. 2, 1922. While here he presented papers on the Newer Methods of Treatment of Neurosyphilis at the Mt. Sinai Hospital and Newer Methods of Treatment of General Paresis before the New York Psychiatric Society.

A tablet with bas-relief to commemorate Dr. Magnan has been placed at the entrance of the Sainte-Anne Asylum, formerly in his charge.

President Harding has announced that he is satisfied with the service of Brig.-Gen. Charles E. Sawyer, his personal physician, and will not ask his resignation as demanded by the American Legion in its national convention held at New Orleans. It was stated also at the White House that the Federal Board of Hospitalization of which Dr. Sawyer was chairman was a voluntary creation of the President and as such the President assumed all responsibility for it. The President, it was also explained, plans to bring the hospitalization board into closer coöperation with the agencies of government having to do with the treatment of disabled former service men and by this of the old Heraclitian, Protagorean disciplines of exact observation, new arrangement expects the hospitalization board to more than justify itself.

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All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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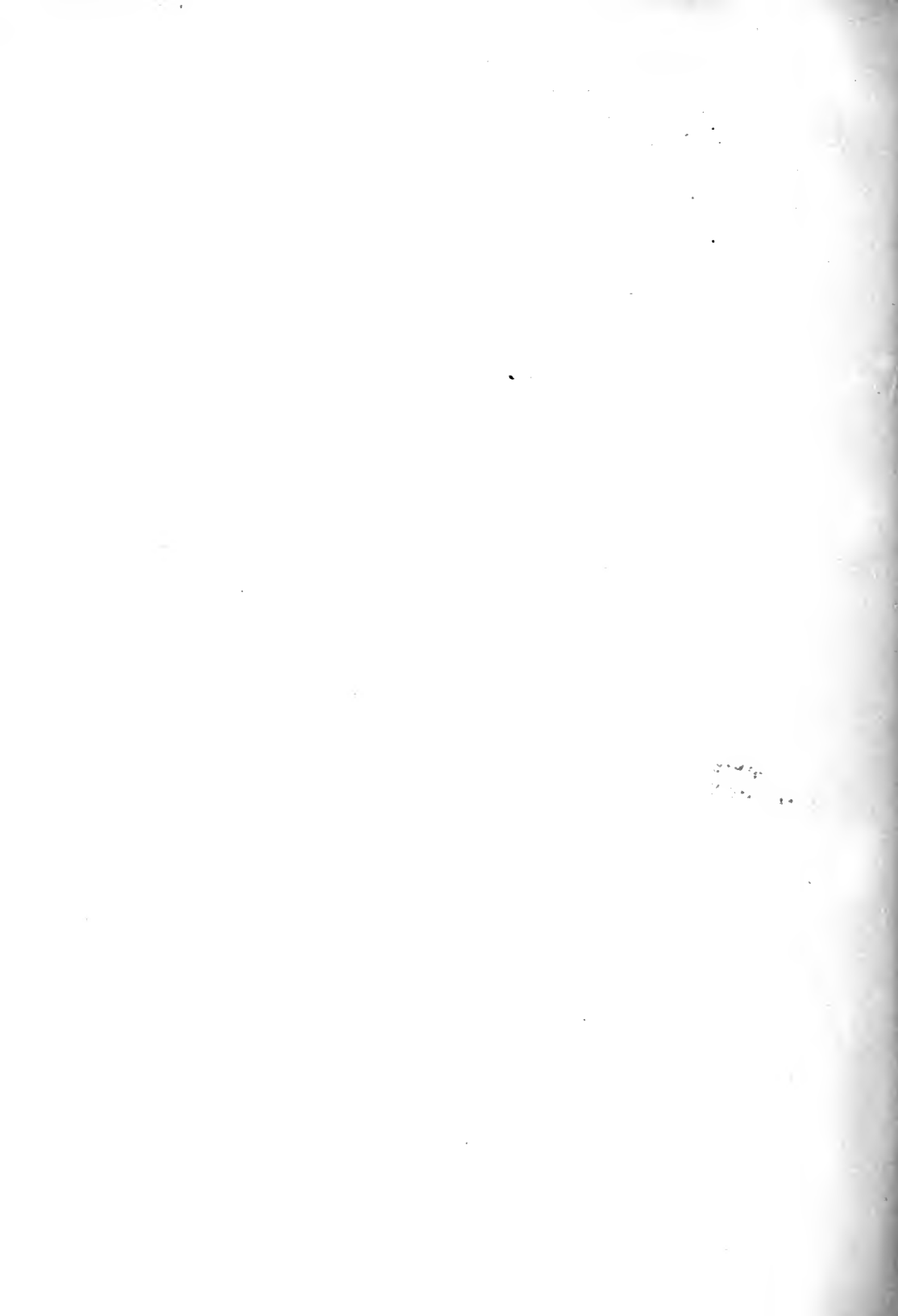
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