

is so complete, functional activity is so rigidly restricted to limited cortical areas that consciousness, if it exists at all, exists in such a weak form that amnesia results. The writer recalls one case of ineffectual suicide in which the patient made a good recovery but could never recall the act. In another case of melancholia the mother drowned her only daughter, a little girl to whom she was passionately devoted, told some one of the act shortly after its performance, and then sank into a partially stuporose state. After recovery she could not recall the occurrence. Such cases are especially interesting, as they seem to indicate that there may be a retroactive amnesia. Events are feebly registered in consciousness, partially recalled, and then completely obliterated from the mind. These cases also demonstrate how purposive acts may still be attended with amnesia. As Ribot says: "There is no contradiction in admitting that a nervous state, sufficient to determine certain acts, may be insufficient to awaken consciousness" ("Diseases of Memory," Ribot).

THE EMOTIONS.—The emotions or feelings seem to be almost a part of ourselves so readily are they elicited by the slightest provocation. When analyzed the feelings are found to arrange themselves in two large classes: those that are expansive and those that are depressing. The former are the basis of pleasure. The latter underlie sadness, pain. Among the sane the feelings are under the control of the individual to a greater or less extent. The extent of the control depends largely on personal idiosyncrasy. Among normal individuals we notice the greatest diversity in the expression of the feelings. Some are always quiet and undemonstrative, others excitable, bounding from one extreme to the other. The former are called phlegmatic, the latter emotional. There is a happy mean difficult of definition, yet readily recognizable. Excessive emotionalism implies lack of equipoise and such persons are said to be *hysterical*, implying by that term feeble self-control.

Insanity is characterized by weakened inhibition. The emotions are emphasized, and the patient makes few and ineffectual attempts toward restraining their expression. All those feelings that are the outgrowth of the two great classes of emotion, pleasure and pain, receive constant expression in insanity. Affection, hate, jealousy, envy, revenge, and innumerable feelings are exhibited by the insane, and attempts at suppression and concealment are the exception. All these varying emotions are intimately identified with action. The acts of the insane are often instigated by the overwhelming and uninhibited stress of the emotions.

Whatever opposes individual desire is painful, and whatever assists the accomplishment of our ultimate purposes is pleasurable. In the various phases of insanity the ego is depressed or exalted by the character of the ideation. The maniacal person has confidence in his own superiority, he is sure of success, schemes cannot arise too rapidly for his competent disposal. He is elated and hopeful. On the other hand the melancholiac has lost all hope. His cherished plans are not realized, the failure in physical health and strength incapacitates him for sustained mental and manual work and confirms his belief in his own incompetency. In the maniacal patient, in the early stages of paresis there is exaltation of the ego; in the melancholiac there is abasement of the ego. In the paranoiac there may be feelings of depression, but for a somewhat different reason than in the melancholiac. The paranoiac has primarily unbounded egoism. He feels that his real merit is not recognized and that his plans do not meet with success because of the determined and malignant opposition of those who are jealous of his fancied ability.

This imagined opposition, coupled with the fact of non-success and non-recognition by the world, awakens feelings of intense displeasure and pain. By constant brooding over his failure in life, which is really the result of incompetency and not of unrecognized merit, his first feelings of depression are, by virtue of his primary all-overpowering egoism, transferred into feelings of suspicion, then of hate, fear, and desire for revenge. So

the paranoiac, who begins with a state of overweening egoism, merges into depression, passes from that to feelings of suspicion, then to fear, and finally to the bitterest sort of hatred. In this latter state of the feelings he is ready for revenge. Nothing short of homicide can satisfy the overwhelming sense of injustice with which he feels he has been treated. Could the innermost feelings of such men as Guiteau and Prendergast be dissected and spread before us for observation the network of mingled emotions of pride, egoism, hatred, jealousy, and the like would be a revelation and go far toward convincing us that such unfortunate creatures are in a maelstrom of emotion impelling them on with resistless violence.

IMPULSIONS (*Imperative Conceptions, Fixed and Insistent Ideas, Obsessions*).—Disturbances of the will and the emotions are closely related to the not uncommon symptom of impulsions known also by the other synonyms above mentioned. Ideas obtrude themselves in consciousness, meet with feeble or absolutely no resistance, and are then realized in acts which are as varied as the ideas they represent. Impulsiveness characterizes all the acts of the insane, may even be a striking idiosyncrasy of some sane individuals. Many persons of ability and mental integrity are impelled by a certain inherent quality of mind to act hastily on the spur of the moment and without the thought, delay, and reflection that are associated with a mature judgment. Children are notoriously impulsive. They seek instantaneous gratification of their desires, not always with due regard to their own best ultimate interests. Arrived at maturer years, however, the child who develops normally exercises reflection and judgment and the impulsive action of an earlier period yields to the deliberative and conservative conduct of adult life.

The forms of insanity in which dementia is not far advanced are characterized by an impulsiveness and a weakness of inhibition that is as striking a feature as are the similar conditions in childhood. Feeble inhibition, imperfect exercise of the will are prominent symptoms of insanity, and play an important part in the genesis of imperative conceptions. Macpherson's explanation of the pathology of obsessions is certainly plausible. Dissociated action of the neurons is the underlying pathological condition. Certain neuron groups, he argues, for some reason become highly resistive, then the discharge of currents modified by these particular groups seeks an outlet through other, though limited, channels. For this very reason the discharge is all the more intense, and the oftener it is repeated through the newer routes the more easy and persistent does its manifestation become. If this mechanical explanation is correct, it is easy to understand how ideas representing the limited and dissociated action of certain cortical areas are projected with great violence into the individual consciousness. The will power which depends upon the normal associative action of all the neuron groups is limited or so reduced as to be ineffectual, and the ideas acquire an intensity and persistency that seek immediate gratification in approximate action. Imperative ideas are accompanied by marked emotional disturbance which intensifies their persistency. The startling abruptness, the utter irrelevancy, the entire absence of any rational cause for the existence of these insistent ideas are clinical evidence of their mechanical origin in neuron dissociation.

However we may explain the mechanical origin of imperative conceptions it is a fact that they are of very frequent occurrence among the chronic insane, especially in the hereditary and degenerative types. In nearly every instance they are associated with a weakening of the will power. However much the patient may desire to banish these ideas from his mind he is utterly unable to do so, and usually is compelled against his will to yield to the appropriate action which they so insistently demand. Such impulsive acts are innumerable, and as varied as thought itself.

At one time it was the fashion to classify insanity into groups according to the character of the imperative conception. There were misophobia, folie du doute, kleptomania, pyromania, and many other species. Such

a classification by symptoms is extremely confusing. Every new obsession becomes a new species of insanity, and when occurring in the same person necessitates a change of diagnosis, while in reality the underlying disease process in all such cases is the same. While impulsiveness, emotionalism, weakening of the will power are all prominent features in the symptomatology of insanity, obsessions undoubtedly represent a specific pathological process. They arise subconsciously, have no associative relationship with other ideas, enter the domain of consciousness unbidden, awaken the most positive emotions, and finally by their very persistency compel their realization in conduct against every possible effort of the will. Individuals with a vicious heredity, those who possess a neurotic constitution as the result of either direct heredity or some degenerative process, the hysterical and the neurasthenic, are favorable subjects for the development of obsessions. Such individuals oftentimes realize the absurdity and even the moral obliquity of the impulsion, but seem powerless to resist its domination. Sometimes it is an impulse to repeat a certain word or phrase, again to touch certain objects with the hand or foot, or it may even be an overwhelming impulse to homicide or suicide. The patient may be startled and frightened at the unexpected suddenness of a conception which seems thrust upon his consciousness without reason and without his bidding; it may be an idea against which his whole moral nature may rebel. Quite frequently such persons realize their helplessness and beg to be restrained before they yield and commit some act fraught with danger to themselves or others. The underlying disease process in all such cases is serious. The prognosis is grave, for the symptom is usually the expression of a degenerative condition. So frequently are obsessions met with in the hereditarily neurotic temperament that they are often regarded as psychic stigmata of degeneracy.

Impulsions may be of great medico-legal importance. Occurring as they often do in those who are intellectually coherent and intelligent, it is difficult for one not familiar with their origin and development to realize their arbitrary involuntary character. Many obsessions are wholly harmless, such as the fear of contamination, the touching of objects, the doubting mania; but others lead to the perpetration of criminal acts, such as the impulse to steal, to set fire to property, even to suicide and homicide. While purely impulsive insanity as a defence for crime should be investigated with the utmost care, it is well to remember that when such attacks do occur in individuals possessing neurotic heredity and unstable mentality there may be such a weakening of the will power as to render them quite irresponsible for their acts.

PERTURBATIONS AND PERVERSIONS OF THE MORAL SENSE.—Maudsley calls the moral sense a "function of organization." There can be little doubt that the moral sense is the accumulated product of the slow acquisition of ages of human experience, aided by hereditary transmission. Originating in the remote primeval past as a utilitarian expedient for the welfare of families and tribes, this sense of right and wrong has through countless centuries of experience and religious revelation become a thoroughly organized function. From being the product of a narrow and selfish utilitarianism the moral sense is slowly progressing toward a higher, more unselfish, altruistic plane. As might be expected, this latest and most unstable psychical acquisition is one of the first to disintegrate upon the appearance of either functional or structural disturbance of the brain. Whatever comes last in the process of evolution is the first to deteriorate in the retrograde changes of devolution.

Imperfection of the moral sense appears as the result of congenital deficiency, or it may be the product of functional or organic brain disease occurring in adult life. Congenital moral defect is one of the stigmata of degeneracy. In the normal individual the moral faculty does not attain to its full growth until mature years are reached. The moral development of the individual is in a way an epitome of its development in the race. The child is selfish, seeks self-gratification, and does not have

that strong regard for the feelings of others that we consider the ideal condition of later years. Even in the development of the normal child much depends on environment, teaching, and associates. Given a good heredity and environment, and the normal child very early evinces a proper regard for the rights of others, a sentiment of right and wrong, and a desire to reciprocate favors. The accumulated acquisitions of the past are not lost, and in the psychical development of the normal child the moral sense soon shows the advantages of good birth and training. On the other hand, the degenerate child, the offspring of neurotic ancestry, may disclose an utter incapacity for moral development. Such children are selfish, have no regard for the rights and feelings of others, oftentimes delight in the torture of animals or the abuse of younger and feebler children than themselves. Arrived at mature years they are erotic, oftentimes yield to beastly sensuality, and are naturally criminal by instinct in all their desires. The idiot and the imbecile often manifest this imperfection of the moral sense which becomes a true stigma of their degeneracy. Occasionally there is encountered one of those moral monstrosities in whom there is a bright, keen intellectual development but without any evidence whatever of moral sense. Such individuals, by reason of their cunning, their ready wit and perception, are able to make quite a fair advancement in life, but usually sooner or later their vices bring them into the hands of the law. E. H. Rulloff was a notorious example of this class. Jesse Pomeroy, who early disclosed his degeneracy in the torturing of young children, has shown quite a little intellectual capacity without any accompanying moral sensibility.

Turning from those individuals whose moral imperfections are the stigmata of their degeneracy, we may glance at those whose early life was one of normal development. When such persons become insane, the moral sense manifests some change at an early stage of the disease. In nearly every case of insanity there is marked displacement of the ego. There is exaltation or abasement; self-concentration is a prominent symptom in acute and chronic insanity. With such distortion of the ego there quite naturally follows a selfishness that leads the patient to dwell on personal feelings and ends rather than on the consideration of others. Hence it follows that the insane are very apt to disregard the feelings of those who are nearest and dearest to them, they often become suspicious and abusive of those who have given them no reason for offence. Quite frequently such patients will commit all sorts of depredations on the rights of those who have incurred their unreasonable hatred. So far lost do they become to a sense of right and wrong that they may even take life itself. It is well to bear in mind, however, that knowledge of right and wrong and of the nature and quality of a criminal act may be retained long after the will power to refrain from committing the offence is lost. Particularly is this true of the paranoiac and the subjects of systematized delusional insanity. In these cases the power of inhibition, of making a choice between two courses of action in which the feelings are strongly enlisted, is impaired long before the moral judgment is destroyed.

As might be expected, the insane in whom there is marked structural brain impairment show striking failure in the moral sense. This is especially noticeable in paresis and quite frequently in senile and secondary dementia. Quite often moral lapses in individuals, who have lived blameless and correct lives in the past, are the only evidence of incipient brain degeneration. A weakening of the moral sense is not uncommonly seen in the exhilarated phase of alternating insanity, or in attacks of recurrent mania. Sometimes patients, during the intervals between the attacks, are exemplary in every way, but with the beginning of the excitement and before it is even noticeable they become erotic and so lose their moral perception as to gratify their passion. Upon recovery such lapses from virtue give them the keenest feeling of shame and remorse. In one case in the writer's experience, in a young woman, this was the only evidence

of insanity for years. Her conduct was so shameless that in sheer desperation her people had her committed to a hospital for the insane. For two years it was a question whether restraint was legal, so clear were her intellectual faculties. The patient herself continually protested against her detention, claiming that if she chose to live a fast life it was her own affair and no one else had any right to deprive her of liberty for that reason. In about two years from the date of her admission she developed disturbance in the intellectual sphere, becoming incoherent, destructive, and noisy. From that time she has averaged attacks of intellectual confusion once a year. In the interim between the attacks she seems perfectly well. The failure of the moral sense alone at one time, of the intellectual faculties at another, and the frequent association of defects in both the moral and intellectual spheres on still other occasions in the same person are evidences of the unity of mind and its dependence on cerebral cell integrity.

DISTURBANCE OF CONSCIOUSNESS, ALTERATIONS OF PERSONALITY.—Consciousness and the personality are physiologically closely related. Consciousness is that state by which the ego is made aware of present and past sensations and impressions. It is constantly changing, being modified by the countless sensations and psychic impressions that are continually flowing in upon the individual mind. By a certain voluntary selective power, that is the inexplicable possession of every normal individual, consciousness can be directed in this or that direction. Irrelevant trains of thought can be excluded and only those conducive to a certain desired end retained in consciousness. This is the power of attention so essential to success in life and so characteristic of a sound and healthy mind. The ego, the personality that is the essential part of ourselves, that part that each one recognizes as his own most characteristic self, and that every one else associates with this or that individual and with no other person, this ego is the complex resultant of all present and past sensations, impressions, and experiences which is recognized by consciousness. Self-consciousness is that power by which we recognize our own immediate existence here and now and identify it with the same individual existence which has passed through definite experiences and associations in the past. Consciousness is the grand inheritance of animal life and serves to distinguish it from plant life. The dawning of consciousness is, as John Fiske says, "one of the most wonderful moments in the history of creation, the foreshadowing of the true life of the soul" (John Fiske, "Destiny of Man").

Consciousness, the power of voluntary conscious attention, and the personality have a close physiological relationship, and for their normal expression depend on the integrity of the neurons. Slight pathological disturbance of the neurons leads to weakening of the power of voluntary conscious attention as well as to alterations of personality. Graver affections of the neurons may lead to actual interruptions of consciousness, to suspension of the normal personality with substitution of automatism, and to a modified personality so unlike the original normal self that it has been called a secondary or subconscious personality. Consciousness is wholly suspended, in sleep, by the influence of drugs, by traumatism, by epilepsy and other conditions. It is partially suspended or interrupted by the functional or organic brain disturbance accompanying insanity.

One of the earliest symptoms of insanity is a weakening of the power of conscious attention. The patient is unable to inhibit irrelevant trains of thought. He neglects his daily avocations, fritters away his time on needless work, or remains so self-centred as entirely to omit the demands of the hour. Oftentimes imperfectly performed work and neglect of necessary details are the first evidences of mental alienation. As the mental disturbance progresses the change in the personality increases. Relatives first and acquaintances later realize a change in the individual. They say he is not the same. He becomes another and a different person. He does not look at things in the same way, he cannot be depended upon

to react as formerly to similar influences. It is not always an easy matter to define the exact change. There may be irritability, impulsiveness, or hesitation, incapacity. Among the symptoms of dementia nothing is more noticeable than this gradual reduction of the personality to a simpler entity. In this retrograde metamorphosis consciousness loses its definiteness and in the last stages of the disease becomes all but extinct, leaving a mere subconscious, vegetative existence.

Disturbances and temporary suspensions of consciousness with alterations of personality occur at times. Such cases deserve most careful study not only for their medico-legal importance, but for the reason that they may throw much light on the nature of consciousness and its association with memory and the formation of the normal ego. Consciousness may gradually fade away and lose itself at last in a state of subconsciousness in which automatism is the chief characteristic. This condition is often noticeable in post-epileptic states, in hysteria, in somnambulism, in the confused state following the toxic effects of alcohol, and occasionally succeeds profound nervous and mental shock, or accompanies the acute functional psychoses. Such conditions are recovered from but leave no recollection behind them. During the period the individual may have performed many complicated and at times apparently purposive acts, but on recovery has no remembrance of what he has done. The period is an utter blank to him. While in this subconscious state persons have been known to leave their homes, travel to remote places, and live another life, awakening to their normal consciousness to find themselves in a new and unfamiliar locality with no realization of where they are or how they came to be there. These phenomena deserve further consideration.

The disparity between the spheres of mind and matter is so great that we continually forget that there is a most intimate connection between the two. This connection is, however, so subtle and elusive as to confuse and perplex our studies. It is only when we are confronted with some strange and very unusual psychosis, such as hypnotic trance, transitory amnesic frenzy and the like, that we realize the close relationship between functional activity of the material mechanism and psychic phenomena.

What is the physical basis of consciousness, the obscuring of which plays so prominent a part in these psychoses? Recent physiological research localizes "conscious processes in the cerebral cortex, within which the sensory tracts end and the motor begin." Dr. Jakob also says in this same connection: "Above the reflex arc which is constituted from the two peripheral neurons there is, as it were, a second arc, which is made up of the central motor and sensory neurons together with their connecting pathways in the cerebral cortex. The latter serves for the conduction from a conscious sensation to a voluntarily innervated movement, that is, for the act of the will." Unquestionably the "cortex is the sole organ of consciousness in man."

This being the anatomical substratum of consciousness, what are the physiological conditions that underlie its manifestations? Full, complete consciousness presupposes functional integrity of the cerebral cortex. If this continuity and integrity of functions be interfered with there is very likely to result what Janet has called "a contraction of the field of consciousness." This may amount to almost complete obscuration, or even lead to alteration of the personality. In this way Binet has said that hysterical anaesthesia is really anaesthesia from "lack of consciousness."

It is even possible for normal consciousness to be submerged and dominated, as it were, by a subconscious condition. This subconscious condition with its power to initiate motor processes evidently has an existence and a memory of its own, for it has been successfully recalled by hypnotic suggestion, and thus demonstrated to have had an existence when the normal consciousness was suspended. Integrity of action within the cerebral cortex is thus extremely essential to normal consciousness. This

is in accordance with the teaching of psychology. Professor James says: "We see that the mind is at every stage a theatre of simultaneous possibilities. Consciousness consists in the comparison of these with each other, the selection of some, and the suppression of the rest by the reinforcing and inhibiting agency of attention." Such comparison, selection, reinforcing, and inhibition must have their organic substratum in the countless connecting neural pathways of the cerebral cortex. Normal consciousness depends upon an associative action of these various neural pathways. Consciousness will be obscured when there is defective associative action. Dissociation is the chief pathological factor in all long-continued insanity. Hence reductions of the normal consciousness are a prominent feature in the symptomatology of all advanced insanity.

II. PHYSICAL SYMPTOMS.

The physical symptomatology of insanity may be studied under the following heads:

1. Congenital physical malformations,—the physical stigmata of degeneracy.
2. Disturbance of function in the organs of special sense,—the eye, ear, nerves of touch, etc.
3. Disorders of vital function,—sleep, body weight, temperature, respiration, circulation, blood changes, secretions from glandular organs such as sweat glands, salivary glands and kidneys, general nutrition.
4. Disturbance of motility, including exaggerated and diminished reflexes, as well as those voluntary and involuntary muscular movements that are concerned in facial expression and those motorial activities that lead to the countless postures, attitudes, and automatic movements that form so characteristic a feature in the symptomatology of insanity.

1. Various physical malformations may occur in the different portions of the body. The most striking are those affecting the sutures of the skull. There are no deformities that are pathognomonic of insanity. The lower type of degeneracy the more pronounced the departure from the normal. Asymmetry of the cranium and of the face is a striking feature in low-grade imbeciles and idiots. Arrest of development of the brain leads to a microcephalic skull. Early ossification of the sutures may cause a distorted cranium as seen in the keel-shaped, sugar-loaf shaped, and kidney-shaped heads of certain degenerates. Unequal development of the orbital cavities, and excessive or atrophied growth of the jaws are asymmetrical types quite frequent in persons of degenerate inheritance. The hard palate is variously affected, and usually it is thought that the high-vaulted, gothic-arched, and saddle-shaped palates are a mark of inferiority. Such palates are supposed to represent a retarded development of the brain in the parietal region, resulting in a coming together of the alveolar bodies and a corresponding encroachment on brain growth.

In the special-sense organs anomalies of the ear and hearing are noticeable. Among the insane we find asymmetrical ears, large, atrophied, pointed, or flat. In the degenerate insane and criminals the ears often project from the skull almost at right angles and present a striking appearance when viewed from either front or behind. Double or unilateral deafness is not unfrequently met with as an hereditary defect.

The eyelids are not unfrequently deformed in those of degenerate stock. A short upper eyelid leads to exposure of the sclerotic. A thickening of the eyelid over the inner canthus gives a peculiar Asiatic expression to the eye and has led to the name Mongolian idiot.

Among other physical stigmata may be mentioned scarcity or abundance of hair, especially in unusual situations in either sex. In many insane women of the chronic and incurable class there occurs quite a heavy growth of hair on the chin and upper lip, and sometimes masculinity of voice is present.

The above-mentioned stigmata are not found in the acute curable insane, they are the physical marks of a

congenital degeneracy that is usually associated with criminality and imbecility.

2. Disturbance of function in the organs of special sense plays an important part in the symptomatology of insanity. Cutaneous sensibility is very frequently affected. At times there is hyperaesthesia, again anaesthesia or paresthesia. Regis calls attention to the fact that an important distinction must be made. He says: "It is not usually the tactile sensibility, strictly speaking, that is modified; that which gives us notions of form, direction, consistence, position and resistance of objects, that is commonly intact. What is impaired is the sensibility to physical agents, heat, pain" (E. Regis, "Practical Manual of Mental Medicine"). In many cases a morbid sensation is purely central. A sense conception, originating within, is by its very intensity projected outward and referred to its proper peripheral locality; it is then an hallucination. Such is the force of morbid ideation that no amount of argument can dispel the imagined sensation. In a large number of cases there is undoubtedly a pathological disturbance of the sensory nerves of touch in different portions of the extremities. These are oftentimes wrongly conceived or interpreted by the mind, are very likely modified by the prevailing ideas and emotions, and so become the illusory basis of a delusion. Imperfect circulation in the periphery may lead to a sense of formication, of heat or cold, and such perverted sensations may be misconstrued by the mind to mean electrical shocks from invisible batteries.

The hysterical often have most striking disturbances of tegumental sensation. Local anaesthetics and hyperaesthetics play a very prominent part in the symptomatology of hysteria. Among the insane nothing is more remarkable than the analgesia that occurs in many cases of acute functional insanity, and in nearly every case, to a greater or less degree, of dementia secondary to structural brain disease. In acute mania and melancholia there is oftentimes the greatest insensibility to heat and cold. In the depressed stage of *dementia praecox* the patients are profoundly insensible to what would, under normal conditions, occasion the most exquisite pain. Patients under these conditions often mutilate themselves with ligations, with scissors, needles, and with hot substances and apparently experience little if any real pain. Among demented patients there is very little sensibility to heat or cold. Such patients must be carefully guarded against extremes of heat and cold in the weather, against scalding in bathtubs, for, owing to their universal analgesia, they are unable to protect themselves.

Disturbance of taste not unfrequently occurs in cases of systematized delusional insanity, and especially in patients suffering from acute melancholia. The obstinate constipation and toxæmia following imperfect intestinal digestion may lead to the foul or bitter taste in the mouth which is wrongly interpreted by the mind, but it is also supposable that sensations are imperfectly received at the peripheral terminations of the gustatory nerve and irregularly conducted to the brain. These perversions of function are quite probably the source of many of the hallucinations of the chronic insane.

The olfactory sense is often exalted or depressed, and its perversions are, as in the functional disturbance of the other senses, the starting-point of hallucinations and illusions. The special senses of hearing and vision are perhaps more frequently disturbed than any of the others. In acute mania there is exaltation of functional activity in these special-sense organs. In melancholia there may be perversion of function and illusions as a result. It is not unlikely that the varying blood pressure in the functional psychoses may have much to do with these perversions. The disturbances of sight and hearing soon subside upon either the removal of the toxin from the circulation if it is a case of toxæmia or upon the return of the blood pressure to normal conditions during convalescence.

3. Among the disorders of vital function in the insane none holds a more conspicuous place than insomnia. One of the earliest premonitory symptoms of the acute func-

tional psychoses is sleeplessness. Before the attack is actually declared the patient usually passes days and occasionally weeks of insomnia. Sometimes worriment



FIG. 2816.—Case XXXIII. Acute Suicidal Melancholia. Taken at height of attack. Trophic alterations, ocular divergence, and self-absorption well marked. (From photograph taken by author.)

over real troubles, financial, domestic, or otherwise; again excessive and protracted mental work induces such a state of cerebral activity that the individual becomes unable to inhibit special lines of thought on which he is engaged and his normal measure of sleep is reduced fully one-half or one-third. This serious interruption of a necessary physiological process leads to a dangerous increase of tissue waste with imperfect repair. The insomnia thus acquired continues after the mentality is impaired, and becomes one of the most serious symptoms which the physician is called upon to treat. Return of normal sleep after a long period of wakefulness is one of the most favorable indications of returning convalescence. After prolonged insomnia associated with mania or melancholia, beginning recovery is ushered in with deep sleep of many hours' duration.

FIG. 2817.—Case XXXIII. Taken five months later. Convalescence established. Healthy ideation and restoration of physical health. (From photograph taken by author.)



The toleration of insomnia is occasionally quite remarkable. Days may pass with only a fragmentary sleep, in all aggregating only a few short hours. Subconscious states usually exhibit few signs of fatigue. Von Hartmann says: "The unconscious does not grow weary; but all conscious mental activity becomes fatigued." Among the chronic insane there is often protracted insomnia, but usually in this class there is an adjustment as well as a compensation. Such patients may remain awake and in a state of noisy activity; but, after twenty-four or forty-eight hours, they sleep soundly for several hours and awake refreshed to renew their excitement and volubility. These cases are exceedingly prone to remain awake nights and sleep days, much to the discomfort of their associates. As a rule the chronic insane are good sleepers,

and the wards of a hospital in which these patients are located are as quiet as any private house.

A reduced body weight previous to and during the active stage of the acute psychoses, and a gradual return to normal or supernormal weight during convalescence are matters of common observation in hospitals for the insane. Every well-regulated institution pays very close attention to its dietary, and records from time to time the weights of its patients. As a rule there is marked loss of flesh in the early stages of melancholia. Capricious and irregular eating, imperfect assimilation with scanty repair of tissue waste characterize all these cases. They look thin and sallow, their clothes hang rather than fit their bodies, their eyes look hollow and their cheeks and necks often wear a painfully cadaverous expression owing to the disappearance of fat from the subcutaneous cellular tissue. One of the chief objects of treatment is to secure regular and thorough nutrition with an easily digested and assimilable diet. If necessary, tube feeding and lavage of the stomach are prescribed in order that nutrition may be promoted. During treatment it is the custom in most institutions regularly to weigh such patients, for a progressive increase in weight is a pretty sure indication that improvement is at hand. (For illustration note the marked change in Case XXXIII, Fig. 2816, at the height of the attack, and Fig. 2817, at time of convalescence.)

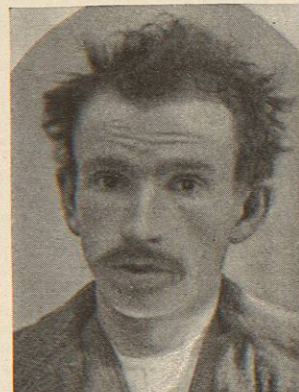


FIG. 2818.—Case XLII. Acute Mania. Taken during active stage. Morbid innervation, trophic alterations, neglect of personal appearance. (From photograph taken by author.)

The same observation applies to cases of acute mania, though not with the same constancy as in melancholia (see Case XLII, Fig. 2818, during active stage and Fig. 2819 at time of recovery). In mild mania nutrition is often very good and the body weight but little changed from the normal. In extreme maniacal agitation, however, there is often great reduction in the body weight, and in typhomania emaciation is extreme.

Among the chronic insane and the demented there is quite frequently a state of good nutrition and increased body weight. After the first and active stage of paresis there is apt to occur a period of hearty eating with good digestion and assimilation and a remarkable increase in weight, followed still later in the third stage by failure of assimilation and reduced weight. In alternating insanity there are reduced weight during the depressed stage and return to normal or excessive weight during the active stage. During the depressed period there seems to occur a slowing of all the vital processes, nutrition among the rest, while in the active stage there is an awakening of all the functions, improved digestion and assimilation seeming to be

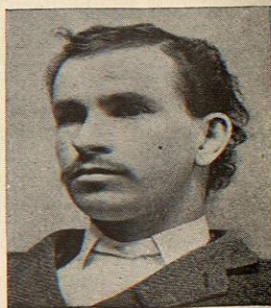


FIG. 2819.—Case XLII. Taken at time of recovery. (From photograph taken by author.)

an expression of the increased metabolism. Of so much importance is this matter of body weight considered that it is customary in hospitals for the insane to record on a clinical chart, by a rising and falling scale, the increase or decrease of weight.

The temperature in insanity is not markedly increased. In some attacks of acute mania there is slight elevation of not usually over 101° or 102° F., at most. In melancholia and in *dementia præcox* there is not only no elevation, but the temperature may be subnormal. In the large number of the chronic insane there is absolutely no change whatever. In paresis and in cases of structural brain deterioration there may be remarkably high elevations of temperature following attacks of embolism, and serous or hemorrhagic effusion. Occasionally in these cases the temperature will range from 104° F. to even 107° F. Such unusual elevations are of serious import and indicate a grave prognosis.

The respiration is not seriously disturbed in insanity. In mania there is little alteration. In melancholia there is apt to be a slower respiration with shallow inspiration, but nothing that can be regarded as especially pathognomonic. In cases of dementia secondary to embolism or to an attack of cerebral apoplexy there may occur a characteristic Cheyne-Stokes respiration with the rhythmical increase of respiratory movements followed by marked decrease. In one case under the writer's observation the rhythmical increase in the respiration was accompanied by a cyclical return of consciousness, which soon subsided as the respiration became slower, and during the period of cessation the patient sank into unconsciousness. This rhythmical ebb and flow of the vital forces continued for some days before death.

The force and frequency of the circulation and the blood pressure among the insane have received careful study. There is a greater frequency of heart disease among the insane than among a corresponding number of sane persons. The frequency of arteriosclerosis in the insane is now a well-recognized pathological fact, and plays a prominent part as an etiological factor in a large proportion of cases of insanity in middle and later life. The muscular walls of the heart are weakened in many cases of chronic insanity, and rupture of that organ is not so very infrequent an occurrence; two cases within one year happened in the writer's experience. A series of sphygmographic examinations were made at the Bethlehem Royal Hospital by Maurice Craig, M.D., and reported in the *Lancet* of June 25th, 1898. The article deserves careful study. Among the conclusions arrived at the following are especially noteworthy: 1. The blood pressure is higher in states of depression, and returns to normal after recovery. 2. It is lower in states of excitement, and returns to normal after recovery from such conditions. 3. The blood pressure tends to fall as the day advances, and hence melancholia cases tend to improve toward afternoon, while mania cases grow more excited. 4. In stuporose states the blood pressure rises. 5. The lowered blood pressure following acute mania is exhaustive in origin, and will remain lowered until its return to normal after recovery. 6. Experiments thus far do not enable one to say that insanity is caused by variations in blood pressure. Such variations do, however, suggest a line of treatment. Thus the feeling of weight and oppression on the vertex is undoubtedly vascular in character, and when the blood pressure is relieved by hydrotherapeutic or medicinal measures the distressing sensations disappear. In short, Dr. Craig's conclusions furnish a strong argument for hydrotherapy in the acute functional psychoses. A very rapid and somewhat weakened pulse is frequently noticeable in cases of melancholia and occasionally in mild mania.

The blood itself has been microscopically examined by different observers. Several experiments have been made to test the bactericidal action of the blood of the insane to determine whether the blood of such persons contain toxic elements not appearing in the blood of the sane. D'Abundo "found the toxicity and bactericidal power of the blood increased in all forms of insanity except in the

depressed conditions, in which, on the contrary, it was lessened" (*Journal of Mental Science*, April, 1895). M. Legrain concludes from his study of the subject that the convulsions of paresis are often due to toxicity of the blood. The blood serum is the vehicle of the toxin, and the toxæmia, induced by injections of the blood serum of paretics, reveals itself in symptoms identical with those of uræmia.

Dr. W. Johnson Smyth made a most careful study of the blood and reported his conclusions in the *Journal of Mental Science*, October number, 1890, as follows:

"1. That in insane patients there is a very marked deficiency in hæmoglobin.

"2. That the deficiency is greatest in secondary dementia.

"3. That there is no very marked difference in its amount in melancholia, epilepsy, and general paralysis of the insane, though in the last disease I found very high percentages during the stages of marked exaltation.

"4. That the number of red corpuscles in these insane conditions is below the normal standard.

"5. That the number of red corpuscles is least in secondary dementia.

"That it is greatest in general paralysis of the insane; that the variations in the other diseases are too trivial to attach importance to them."

With reference to the relative proportions of white to red blood corpuscles Dr. Smyth found no variation from the normal. He also concludes that in insanity the blood is usually in a pathological condition, but quite frequently this is a secondary state and not causal to the insanity; he says in "some forms of mental diseases the blood is imperfect *ab initio*, that it fails to supply materials for the growth and development of the brain; whilst that in other forms of mental disease the blood change is secondary to organic disease, and morbid mentality results owing to the inability of the brain of the unstable to resist the influence of its diseased blood supply."

In a recent article by Dr. F. Percival Mackie in the *Journal of Mental Science*, January, 1901, entitled, "Observations on the Condition of the Blood in the Insane, based on One Hundred Examinations," Dr. Mackie draws the following conclusions:

"In looking through the grand averages we cannot help being struck by the slight departure from normal which exists in the blood of insane patients. Though in some cases slight changes are noted with some degree of constancy, yet they are so insignificant that they do not appear to throw any light on the pathology, or give any indication for treatment in any class of cases. When they do occur, there is good reason to suppose that the alteration in the blood state is quite secondary to the mental change; and further, the examination of the blood in the present state of our knowledge is not even an aid to prognosis or diagnosis, as it is in so many diseases."

All the secretions are modified to a greater or less extent by insanity. Ptyalism is a very common symptom in idiocy, imbecility, and cases of chronic dementia. It is often surprising to notice what quantities of saliva may be passed by demented patients. This is occasionally a most troublesome symptom necessitating frequent changing of the clothing or the wearing of rubber bibs. During the waking hours this salivation may be incessant.

The perspiration is variously affected in insanity. In many cases of dementia, melancholia, and *dementia præcox* there is almost entire absence of secretion from the sweat glands. In these patients the skin is dry and scaly, the hair, is brittle, rough, and absolutely free from natural moisture. In other cases there is a cold clammy sweat, due undoubtedly to a relaxed state of the blood-vessels and to feeble circulation. It is a matter of frequent observation that the hands of many insane feel cold and moist and entirely unlike the warm, dry touch of the normal individual. There seems little doubt that a certain peculiar mawkish odor is exhaled from the skin of chronic demented patients. Owing to the lack of healthy muscular tonicity, and the feebleness of the circulation there