THE TRAUMATIC FACTOR IN MENTAL DISEASE.

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THIS article begins with some general considerations bearing on the subject ; and in the second place deals with its special clinical and pathological aspects.

1.—GENERAL CONSIDERATIONS.

(a.) I include all injuries, produced by external violence, affecting the nervous system so as to become a factor in the production of mental disease. Of these, the most important are *direct* injuries to the head, but to limit our subject to these, as some would, is narrow and unscientific, inasmuch as precisely the same mental result and the same lesion may follow cerebral disturbance or injury produced *indirectly*.

(b.) Nor do I (as many do) include insolation here, as a traumatic factor. Clinically similar as are some insolation cases to the traumatic ones, the two appear to be properly kept separate.

(c.) The surgical aspects of the subject are not dealt with here—*e.g.*, questions of surgical operation, traumatic fever, or the symptoms of brain-compression or concussion.

(d.) The traumatic factor may be predisposing or exciting ; may be co-operative in preparing the soil favourable to insanity ; may give rise to mental and other symptoms at the time, but these passing off, the incident may leave some impress conducing to mental weakness or instability, or may leave behind it some organic change which, increasing or undergoing a natural succession of phases, may eventually lead to mental failure or disturbance. Or the mental disease may spring directly and without interval from the occurrence of the injury ; or after a shorter or

longer interval devoid of symptom, or marked only by slight indications of 'threatening nervous and mental failure or perversion.

Thus the traumatic factor may be simply predisponent. Or, at the opposite pole of action, it may be the direct excitant of an insanity already about to appear, the particular spark that happens to fire the prepared train; or it may act on a less fully prepared condition, and modify the course and symptoms of the insanity it precipitates; or it may lead to the formation of a neurasthenic or hysterical condition, and coincidently or thereupon may come psychic disorder; or to the setting-up and development of a special traumatic neurosis, and of a morbid psychosis; or there may perhaps be, primarily, coarse brain-damage; and either secondarily, or without such damage, organic and often progressive destructive brain-disease. These last two groups include the cases of insanity more completely and characteristically of traumatic nature.

(e.) The traumatic factor frequently is but one of several, not often do the causes of insanity act quite singly, several factors usually co-operate; the traumatic factor often modifies, and is modified by the operation of other factors.

(f.) The injury may produce a functional disturbance of suspension only; or, on the other hand, the mental disease may be symptomatic of demonstrable, and often gross, traumatic organic lesion of the brain.

(g.) The *immediate* morbid conditions arising out of injury, and constituting a factor in the production of mental disease, may be molecular perturbation of brain (concussion); or contusion, crush, rupture of its substance, or hæmorrhage into its tissue or into the meningeal spaces; or vaso-motor effects of damage to brain, cord, or sympathetic nervous system. Some of these conditions may promptly produce compression and local anæmia or œdema of brain.

And in these cases the *secondary or remote* morbid conditions of brain, &c., due to injury and favouring abnormal psychosis, may be slow nutritive alteration, inflammation and its exudations, suppuration, hydrocephalic states, local bone disease, chronic inflammation and sclerosis, secondary

degeneration, the absorbent changes following destructive hæmorrhage softening inflammation or ischæmia of parts of the brain-substance; such ischæmia being producible by arterial thrombosis, or by compression of blood-vessels as by clot or exudation. Or tumour-growth, originated by injury, may in its turn foster mental disorder; or press for mental failure through cerebral compression and disorganisation.

(h.) Obviously, the symptoms and the whole course and tendency of the resulting psychosis, other things equal, must vary with the infinitely numerous varieties of kind, extent, and degree of severity of the injury produced; and with the nervous and mental tendencies of the individual. So must they vary, other things equal, with the part or parts of the encephalon functionally affected in any way, disordered in circulation or nutrition, or the seat of damage. Mere mention of this must suffice;—the whole wide subject of the localisation of the functions of the nervous system is involved here.

Especially in the functional cases have I noticed the frequency with which the back of the head has been the part struck.

(i.) Speaking generally, the *age* of the patient is of some effect; the tendency at each age of life being to the production, by injury, of the particular forms of insanity to which each such age is most liable.

(j.) The tendency to insanity of traumatic origin is greater in civilised than in savage man—is enhanced in the subjects of the neurotic and insane diatheses; or in those of sensitive, irritable, excitable, impulsive, wayward nature and disposition; also in those prone to sexual, alcoholic or narcotic excesses; or enfeebled by disease, mental strain, anxiety, insomnia, or privation. Particularly have I observed precedent alcoholic intemperance or syphilis.

(k.) When insanity comes on some considerable time, or long, after the injury, certain conditions are apt to mark the interval between the cessation of the immediate effects of the blow and the advent of the morbid psychosis. Such are the easy production and exaggeration of the effects of alcohol,

narcotics, coition, extreme heat, mental over-work or agitation, the troubles of life and knocks of fortune. Even the excitement of physical exertion occasions an undue cerebral effect and mental commotion.

A change of character is frequent ; and usually is in the directions of unwonted impatience, irascibility, furious outbursts, a quarrelsome, overbearing brutality ; or moody, unsocial taciturnity and suspicion ; and with these, or alone, general mental failure, or gaps in memory ; cerebral fatigue on the least mental exertion or strain of attention ; or mental confusion—a dazed, bewildered condition ; or emotional dejection and hypochondriacal notions ; or an uneasy nervous state, a general *status nervosus* ; bad dreams ; ready addiction to alcoholic indulgence or sexual pleasures.

These conditions may deepen into the prodromal stage of the coming psychosis ; or, when this is reached, we may find suicidal and homicidal impulses, or an expansive phase, and usually insomnia ; or preliminary to the onset of the overt psychosis there may be disquietude, tremor, headache.

Various sensory and sensorial disorders and defects are frequently precursory :—pain in the head, especially at, or chiefly at the seat of old injury, or tenderness there ; or general cranial pain ; or numbness and various paræsthesiæ. The disorders of special sense observed in different cases are too many to mention here ; and they, like the symptoms above-mentioned, vary from the products of focal lesion to the abounding severe symptoms of traumatically roused neurasthenia and even hysteria.

As for the motor conditions which may arise, early or late, there may be found all forms of paralysis, paresis, tremor, spasm, *convulsion*, contracture, chorea, ataxia. Vertigo may occur. These, however, more often belong to the later time of actual mental disease.

At first the symptoms may be slight, but severe later on ; or symptoms severe at the onset may give place to milder and recovering ones.

(L.) Insanity traumatically occasioned may come on immediately or rapidly after the injury, or months, or many years later. It may be related in all sorts of ways to other

forms of insanity; nor is there space here to discuss these relationships with any fulness.

(*m.*) The prognosis is moderately favourable in some of the functional cases; unfavourable in the organic. Intensely severe symptoms at the onset often permit a more favourable prognosis than those beginning slowly, and becoming worse gradually. Epilepsy, or convulsion, is an unfavourable omen.

(*n.*) In some, clinically, so-called functional cases, as well as in the organic, there may really be some tissue-injury, produced by the violent vibration and propulsion of the cerebro-spinal fluid (in concussion), demonstrated by Duret. Or, again, there possibly may be breaking-up of the nerve-fibre myeline, and formation of bodies related to colloid ones (Miles. See BRAIN, 1890, p. 224). Or, when of the ordinary type, limb-paralysis, occurring in some so-called functional cases, on the same side as the cranial injury, may really be due to some damage of the opposite hemisphere of the brain, by counterstroke.

(*o.*) In the later-arising and more typical cases the psychosis is built upon the foundation of a traumatic neurosis—a neurotic state partly described above—springing out of the effects of the original injury.

(*p.*) *Pathologically*, from the shock of a blow may come singly, or in succession—(*a*) jar, shake (concussion as a cause), with its hypothetical molecular changes of structure, as a *primary* effect, and with it more or less suspension of some functions of the brain and spinal cord; (*b*) the basis of traumatic cerebral and spinal neurasthenia, or other neuro-psychosis—namely, some molecular alteration of those organs; and (*c*), as *secondary* or *late* effects; subacute or chronic demonstrable organic brain-disease.

Severe crushes of brain take a different line of morbid process.

Moreover, (1), the original injuries may be to the skull-cap, and the brain be secondarily affected by these. Or (2), the brunt of the stroke may fall on the intracranial blood-vessels, producing rupture, &c. Or (3), the brain-substance itself may suffer primarily and chiefly.

In the third and last case, there may merely be functional disorder and molecular change of the brain ; or, later on, it may become compressed by extravasation or by inflammatory exudation ; or may undergo profound nutritive alterations ; or, on the other hand, may incur gross material primary damage.

Clinically, in the *adult*, we see four great branches diverging from the traumatic stem :—One consisting of functional neurotic states with mental symptoms, chiefly traumatic neurasthenia and traumatic hysteria. Another consisting of ordinary and definite forms of psycho-neuroses—functional mental perversions of the more simple type. Another constituted of those usually of hereditary mental degenerative type, but now either of direct traumatic origin, or merely favoured in formation by injury. And another consisting of mental and other symptoms, severe and very often incurable, tending to dementia and death, and based in damage, or in severe organic brain-changes starting from injury.

II.—SPECIAL CLINICAL AND PATHOLOGICAL ASPECTS.

To begin with, the influence of external violence may be exerted even during *intrauterine life*. Jars, shocks, commotions, explosions, or other injuries, acting through the mother, and affecting the germ-layers of the embryo, or incident on the foetus, are sometimes the source of congenital mental defect, or future mental disorder, both based in cerebro-spinal non-development, malformation, or disease, of traumatic origin. Numerous experiments on the embryos of lower animals show the immense effect of injury in this direction.

Next, when born into the world, man, from the cradle to the grave is pursued by a liability to the effective incidence of the traumatic factor of mental disease. In the first place, the act of *birth* itself—in civilised races especially—is full of danger to the infant. Difficult labour—dystocia—without instrumental aid, easily produces various detrimental cerebral effects, including structural brain-damage ; instrumental aid

often is obtained at the cost of bone- and brain-injury, perhaps extrinsic to the occasion.

And at the next stages of life—in *infancy* and *childhood*—falls and hurts lead not seldom to concussion of brain; or to its contusion, hæmorrhage, crush, or compression—although if this last is due to depressed bone the comparative elasticity of the brain-pan and the circulatory activity and the plasticity in early life, may now permit of a natural and sufficient restoration of the cranial conformation, and restitution of the position and integrity of the brain, without the aid of surgical art.

Congenital injury, or that coming in early life, tends to produce idiocy or imbecility:—often with these are convulsions—usually classed as epileptic, but not seldom more properly epileptiform—talipes, hemiplegia, contracture, wasted limbs. Choreiform or else athetotic movements often attend such cases. Ill-temper, quarrelsomeness, readiness to assault and destroy, come in paroxysms, and epileptoid automatism may be one of the clinical phenomena. The tendency is to impulsive excitement and destructiveness, often of epileptic or epileptoid origin; progressive mental degradation and death. At the necropsy, we find traces of old meningeal hæmorrhages, local wastes, and destructive lesions of brain-surface; but more often a unilateral hemispherical cerebral atrophy, more obvious in some lobes than in others.

Some cases, starting from injury in childhood, take convulsion as the great phenomenon, become confirmed “epileptics”—at least, are so classed—and have all the clinical phenomena—mental failure, welling-up of morbid ideas, violence, irritability and automatism, of the epileptic; although sometimes the condition is only epileptiform. And after death, the only naked-eye morbid brain conditions may be some brain-wasting, and some developmental irregularities of gyri and sulci in the posterior half of the brain, as in *Case No. 1*.

In the next stage of life—that of *youth*—may come seizures in which, after a depressed prodromic stadium, the subject is sleepless, boisterous, loquacious, noisy, violent

mischievous, destructive ; and this either in recurring seizures or subcontinuously. Such cases may recover ; or may become chronic, take convulsions, and die.

Other cases, with injury a factor in youth, and allied to the idiocy-imbecility group, are examples of so-called "moral insanity," and of various other forms appropriately termed of the hereditary mental degenerative series, such as insanity from impulsive ideas, original mental twist, hebephrenia and paranoia.

And next, in *adult* life, more especially, is a great variety of cases. Some of these occur also in youth. According to my observation, in the *adult*, and especially following *cranial* injury, there are chiefly four great groups of mental disorder :—

(1) One consisting of definite ordinary, although perhaps modified, forms of functional mental perversions of the more simple type (psycho-neuroses).

(2) A second constituted of paranoia and its immediate congeners, without or with obvious organic change ; also—

(3) The third, comprising mental and other symptoms dependent on severe, traumatic, organic brain-disease and alteration, whether secondary, or including also the primary damage of the brain. Focal brain lesions, diffused brain-disease ; organic dementia, epileptoid states, general paralysis and conditions akin thereto ; and

(4) The fourth, consisting of certain functional neurotic states, with mental symptoms, chiefly of the type of traumatic neurasthenia and hysteria. These may incidentally crop up in any of the other groups.

The second and third groups comprise the cases more fully and characteristically of traumatic nature, as morbid psychoses.

I.—In the *First* great group, consisting of functional mental disorders of traumatic origin in adults, we take up ordinary, although perhaps modified, psycho-neuroses.

Cerebral and Mental Automatism. Case 2.—Cerebral automatism, stuporous form of hallucinatory insanity, emo-

tional depression. After a cranial hurt, by falling on ice, were automatism and profoundly obscured consciousness for a time during which the patient made his way (about 300 miles) to London, but afterwards retained no recollection of the journey or of how he came; there being a complete mental blank from the moment of the blow on the head to that of finding himself in bed in a London infirmary. The head continued to be painful, especially on the right side, and for a time the right shoulder and right side of chest. Out of the automatism, he passed into a condition of vacant immobility, alternating with restlessness, bursts of weeping, and once an explosive outbreak of transitory destructiveness; and thence into a condition, between hallucinatory and stuporous insanity, characterising the group linking and forming the transition between the typical forms of those two disorders; there being connected dream-romances, or vivid hallucinations of sight, hearing and smell; some stupor; occasional emotional depression and weeping; delusions of annoyance and torment in connection with the hallucinations, which also were of hostile import. An antecedent influence was the disappointment of failure in business.

Case 3.—At the other extreme, as regards rapid or slow evolution of the symptoms, is the next case, in which—long after very severe cranial injury, immediately following intense symptoms, including prolonged coma, treated at the London Hospital, and incurred thirteen years before admission to the asylum under my charge—came pain and tension of head, increased by warmth or by stooping, constrictive head-pain, bad dreams, sleeplessness, strangeness of manner and expression; at times apparently hallucinations or illusions of sight and hearing; kleptomania—the thefts, however, being performed quasi-automatically, and the patient repeatedly finding the stolen articles at his home without being able to tell how they came there. A somewhat self-willed patient, at times voluble, excitable, quarrelsome; occasionally roused to explosive anger, and, then, becoming abusive and insubordinate.

In these cases were hallucinations But characteristic examples of traumatically induced

Acute Hallucinatory Insanity, with unsystemised delusions, are such as that of *Case 4*, with hallucinatory insanity from injury to the head occasioned by a blow from a poker over the back part of the vertex (at about the posterior fontanelle), the loss of blood being considerable, and there being the effect of previous drinking habit, and the mental agitation of a quarrel with, and separation from, the man with whom she had cohabited. Vivid hallucinations of sight and hearing, and of hostile import arose; also delusions of being jeered at, tried for crime, accused of prostitution and of suffering from venereal disease, delusions of impending evil and of the complicity of persons about her in an intended perpetration on her of (physically and mentally) cruel brutality. These, conjointly, led to dejection, a suicidal attempt, and violence to others.

Then, again, in *Case 5*, following in the wake of syphilis and sexual excess, a blow on the top of the head was promptly succeeded by hemiplegia, hallucinatory insanity, great lack of emotional control, delusions of wires being attached to the ears and mouth, of annoyance, of prevention from obtaining a livelihood, of persecution. The symptoms tending to the paranoia group, in character

Melancholic or Depressed Cases.

As *Case 6*, where cranial injury, arising out of a quarrel was followed by a dazed, confused, self-worrying state; sadness, dejection, inability "to content himself" or to fully "know what he was doing"—a state of simple melancholia, with several suicidal attempts. Termination: recovery.

Or, as *Case 7*, where occipital injury in an alcoholised person is a factor. Melancholic notions of wickedness and worthlessness; vivid hallucinations of sight and hearing as to hell and heaven, as to persons being burnt, drowned or coffined. Assertion that he himself had been drowned. Morbid fears of falling forward or backward (somewhat like hypsophobia). The symptoms not of purely alcoholic type. Termination: recovery.

Or, as *Case 8*, in which, at and around the bump, at the vertex, of a cranial injury incurred fifteen years previously,

come a recrudescence of pain and a feeling of numbness. Melancholic delusions of great wickedness; morbid fears; and hallucinations or illusions of sight, hearing, taste and smell. Termination: recovery.

In *Case 9*, aged 50, injury over the upper and anterior part of the left parietal bone, and encroaching on the frontal, had been incurred many years previously, and, latterly especially, he had been very easily affected by drink, to which he was moderately addicted. He was melancholic and demented, there being considerable failure of memory, emotional dejection, dread of vague impending evil, hallucinations of hearing and, for a short time, of sight.

II.—*Paranoia* is the chief form in the *Second* great group; and tending that way are some cases of unsystematised delusion with hallucination. In some cases the cranial injury appears to be a factor acting in early life and modifying the mental state so as to assist in forming the natural bent to insanity—i.e., creating a latent susceptibility to the insanity. Unsystemised delusional insanity with hallucinations at first, may or may not gradually be replaced by the systemisation of established paranoia. Thus (*Case 10*) unsystemised delusions as to hostility against the patient, as to stuff being put in his food, and his being accused of murder, and correspondent hallucinations of smell, taste and hearing—coming on at the age of 25, had been preceded by sequelæ of severe cranial injury at the age of 11.

In this group may also be symptoms of organic brain and cord disease of traumatic origin.

Case 11.—Age 47. Fell on an iron deck, over two years ago, and injured his occiput, was stunned for a few minutes, and found his fingers and toes "numb." Worked for the greater part of a year afterwards; but, and very noticeably so after the expiry of six months, his sight became "misty." He became shaky, had to give up work, was treated at Guy's Hospital (where he had anæsthesia and analgesia of the feet, if his description is correct), and since then in a workhouse and in the asylum under my care. He is depressed, half weeps; has delusions that his friends

are all killed, that he is made incapable of knowing anything, that he is to be killed for committing murder and cutting up children, that false accusations are made against him, that—through the windows—persons tell him he will be burnt up. Hallucinations of taste and smell co-exist.

Forehead and eyebrows raised and corrugated, lower face somewhat flabby; the eyelids blink and twitch; pupils dilated, the right one the larger and sluggish to light. Speech pausing and hemming. Gait slow, with short unsafe steps, and somewhat staggering; stands shakily with *tremor a debilitate*, knee-jerk nearly absent: the patient, nearly blind, describes pains of somewhat fulgurant character. The moderate head-pain is chiefly frontal, when present.

Some become moody, solitary, moping, impatient, bearish, ill-natured, irritable. Then the excitement waxes, is accompanied by threatening and violent language, and may pass into an acute excitement with suicidal attempts and homicidal assaults, and perhaps convulsions. The acute symptoms, passing off, may leave a bitter, resentful, suspicious, morose, unfriendly, unsociable, taciturn, reserved condition and demeanour; and delusions of conspiracy against the patient.

Or, an early and longer or shorter period of more or less excitement may subside into chronic mental perversion, marked by the dangerous, often homicidal, suspicious, irascible, irritable state of the subject; the symptoms in my own experience being of the depressed, hypochondriacal, persecutory, aggressive type; and expansive symptoms coming almost only in the groups next to be described. But some cases, apparently to be classed here, and described by others, present a commingled aspect of the delusional phenomena—oppressed and expansive—those of suspicion mingling with the proud and egoistic ones. Fits of ungovernable fury may paroxysmally add tumult to the scene—fury either of epileptic basis, or not. The end is usually dementia and death.

Or, the change of character already described in the preliminary part of this article may be followed by, or by in-

creased, headache, insomnia, irascibility, failure of memory, or a temporary and somewhat partial darkening of it especially apt to come in connection with "fits"; suspiciousness, homicidal and suicidal impulses; or homicidal assaults under delusion as to the identity of the assailed, as in a case by Brower. These symptoms may remit sharply.

Persecutory or hypochondriacal delusions are frequent; those of poisoning of, or infidelity to, the patient, are not infrequent. In some at least, of these latter cases, the traumatic factor is complicated by the effects of drink. Thus, in *Case 12*, where insanity had followed a severe injury to the occiput seven months before the patient's admission, there had also been moderate addiction to alcohol. The patient had delusions of the infidelity of his wife with a youth next door, of the (real or imaginary) "tappings" heard by him being the signals between the guilty couple; and so intensely suspicious was he that every little circumstance was twisted into support of that view. Becoming miserable about it, he wanted his wife to drown herself together with him; bought a pistol to shoot both her, the youth, and himself; frequently threatened his wife's life, and once attempted to strangle her.

Tendency to alcoholic excess, to dissolute life in any form, moral perversity, brutality to members of family or household, and, later on, graver outrages, brutal and violent impulses, and, perhaps occasional outbreaks of acute mental excitement, mark many cases.

The course is long and changeful, fluctuating from lucidity, or a merely hypochondriacal state, to extreme paranoiacal perversion; the tendency is to fatuity and death. Insomnia, noises in the ears, dulness of hearing, vertigo, local pareses, visual and other hyper-, par-, and an-æsthesias, headache of special characters, are frequent. Symptoms arising may be neurasthenic or hysterical. Marcé described a badly defined form, with irregular alternations of stupor, agitation and imperfect lucidity, without systemised delusions.

Senile Dementia or *Senile Insanity* may be modified and precipitated by injury. Having a distinct basis in organic

cerebral disease it forms a sort of link between this group and the next group, and might be described with the latter. Yet its organic basis is independent.

Case 13.—Aged 71, was admitted after making several recent suicidal attempts. Many years ago a falling cask struck him on the top of the head; seven or eight years ago he was beaten about the forehead; and some months ago his head came sharply into collision with a fireplace. To these injuries he attributes the noise in the head of which he makes grievous complaint—a “humming, bumming, dinging nasty” noise—all over the upper half of the head, and this part he rubs frequently and nervously with his hand. The noise is in the head, it seems to him, and not in the ears. The patient feels ill and miserable, keeps putting the hand to the head, which he rubs as he stands, and he shakes much and complains of being shaky and miserable; and again he complains of the noise in the head, which makes him feel as if he would like to destroy himself. He has no melancholic notions of wickedness or uselessness, but there is a deal more than a distinct hypochondriacal tinge in his statement that he is wasting to a skeleton, and has not a bit of flesh on his bones. Hallucinations are denied. There is considerable failure of memory and general dementia—the failing mind of senile decay, precipitated and modified by the results of injury. He denies addiction to drink. He is a thin, wizened, stooping, edentulous ancient; shaking much, and easily induced so to do, partly from senile tremor of debility; and, occasionally, when he thinks and complains of it, there is great exacerbation of the coarse shaking, as if half-voluntarily. Sight is impaired, the pupils are slightly sluggish to light; the gait is slow and slouching, the knee-jerk present.

III.—We now take up the *Third* group of the traumatically-caused diseases of mind in the adult.

In some cases (as *Cases 14* and *15*) severe fracture of skull is followed, after a considerable space of time, by convulsive seizures of epileptiform character; these increase in frequency, and become associated with the violence after

convulsive seizures and the conditions of mental automatism so often forming part of the manifestation of epileptic mental disorder, and now forming part of those of an epileptoid psychosis. Incoherence, mental confusion, and dementia appear therewith, and increase. Many of the seizures may be quasi-syncopal—a form of epileptiform *petit mal*. Even turning-movements may occur. Local paralysis may come, or tonic spasm, or spasmodic twitches. So may hemiplegia or hemiparesis—partial, or general on the side affected—either only temporarily following the seizures, or else persistent in some degree and temporarily augmenting after the seizures, but ever tending to deepen in degree and, if partial, to extend in range, sometimes with lessened sensibility and lowered temperature on the side affected, between the attacks. The mental state ebbs and flows, fluctuating partly as the seizures appear or hold off, and as it is affected by them; and the patient passes from states in which he is noisy, restless, incoherent, to those in which he is oppressed, languid, or even semi-comatose. There often is some affection of speech, dyslogical—or dysphasic—or dysarthric; and during the post-convulsive pareses or paralysees these speech-conditions are worse. In only some of the cases is this temporary worsening of the speech due to the augmentation of paralysis by convulsive discharge; in most, it is merely an accompaniment of that, and is due to the simultaneous discharge and exhaustion of neighbouring parts of the cortex cerebri devoted to speech-centres and their allies, or due to crippling vaso-motor and vascular disturbances occurring therein. Hence, temporary, or temporarily augmented, motor aphasia, word-deafness, word-blindness, paraphasia, amnesic aphasia, slow speech, pausing speech, hemming speech, syllable-stumbling, quasi-stammering, and blurred, mumbling, and shaky speech. The special senses may become affected, especially is sight apt to fail or cease.

At the necropsy, are changes in the bone at the seat of old fracture, and often osteophyte-like formation of bone-callus on the inner surface; local chronic pachymeningitis; perhaps cohesion of dura, pia, and brain-cortex; wasting, and

variously-produced chronic destructive or indurative changes in the cortex beneath the seat of injury; traces and relics of old sub-dural hæmorrhage, sometimes up to well-formed blood-tumour "cysts;" or of old subarachnoid or pial hæmorrhage, and appearing partly as wasted degenerate areas of the cortex. Counterstroke often has occurred; and, if so, confronting the pole of the cranium, roughly speaking, opposite to the line of incident force, may be the traces and relics of crush or bruise of the cortex, or of meningeal hæmorrhage; and sometimes of sequent local acute and chronic meningitis, in the form of old adhesion bands and meningeal thickening, or old areas of adhesion and decortication, especially about the brain-base.

Atrophy of the cerebral hemisphere chiefly affected has followed, and often is more obvious in the grey cortex than in the subjacent white. Naturally, this atrophy is usually more of the hemisphere on the side the same as the damage to the cranium; but in some cases is more of the opposite side, and, when it is so, is another evidence of counterstroke. The ventricular ependyma is often considerably granulated.

In some (much as in *Case 16*) there are marked chronic meningitic thickening and opacities, gradual cerebral atrophy, and perhaps pallor and fine degenerative changes, chiefly in one hemisphere, by far most marked in the frontal and parietal regions, and often irregularly distributed; slight or no adhesion and decortication, granulated ventricles:—gradual failure of mind, sometimes with symptoms, such as self-satisfaction and mild optimism, showing some connecting links with general paralysis.

Nor are these the only cases in which the question of general paralysis arises. For (as an example, *Case 17*) conditions at least resembling, if not, general paralysis occur in some cases;—coming gradually, some months after severe cranial injury, are strangeness of manner, depression, severe cranial pain, hallucinations and delusions; and later on are physical symptoms fairly like those of general paralysis, and mental failure with large ideas.—although not very variable—adding to the similitude and

disguise ; if similitude it may be termed, and if we do not admit that traumatic general paralysis (as a lesion) becomes practically cured, for the time being, by vigorous treatment ; although there is final deterioration in mind, speech, and gait. For such patients may live a good many years, and at the late-coming necropsy may present, as morbid naked-eye changes, some slight and chiefly fronto-parietal brain-wasting, some chronic meningeal thickening and opacity, and slightly augmented dural adhesions to the calvaria, together with pigmental and other traces of old sub-dural hæmorrhage. Degeneration of spinal pyramidal tracts co-existing.

These last two sub-groups are closely allied to general paralysis, or from the links between it and some other organic brain-diseases, or, perhaps, are to be taken as modified varieties of general paralysis itself. And there are other cases holding a somewhat analogous position.

Such other cases may have less decidedly the traumatic influence ; as, for example, *Case 18*, with symptoms as if of depressed general paralysis, and indistinct physical signs as in general paralysis. The patient was suicidal, and in some respects dangerous ; the subject of sombre emotional dejection, facile weeping ; delusions and hallucinations of hostility, annoyance, persecution, danger, and hypochondriacal and melancholic delusive notions ; occipital pain since the severe cranial injury four or five years previously, and sometimes frontal pain. The pains were worse at night and increased by warmth. Insomnia. Some symptoms of hysteró-neurasthenia. Cardiac disease (left ventricular hypertrophy and dilatation, with leaky valves).

Or, as *Case 19*, with organic brain- and cord-disease from injury to the head five years before admission, and with signs in speech and face considerably resembling those of general paralysis. There were mental depression and weeping ; persecutory delusions of hostility and of condemnation and of impending death at the hands of his torturers, not distinctly systemised ; vivid visual and auditory hallucinations of inimical import, and occasionally leading to excitement. Much cranial pain and tenderness co-existed, as well as spasmodic tremor, increased tendon-reflexes, and an

easily-induced *quasi* terrific shivering or "apyrexial rigor." (For this last symptom, see the writer's "General Paralysis of the Insane," 2nd edit., p. 96).

Another *Case* (No. 20) has links with the next subgroup about to be described. Admitted a week after severe injury to the head and other parts, and treatment at St. George's Hospital, the patient appears to be threatened by traumatic general paralysis; has dementia, moderate loss of memory, and hallucinations; is amblyopic, presents some moderately general-paralysis-like conditions of pupils, tongue, speech, &c. Is in a mentally confused dazed state, which subsequently wears off, and the memory improves; has hallucinations of hearing the voices of the Saviour and of the dead; also, some self-satisfaction, and complaisant, non-chalant acquiescence in asylum life.

Again, there is a group of temporary cases, taking on an appearance of general paralysis, and following quickly or soon after the cranial injury; that is to say, cases simulating general paralysis, but soon clearing up or improving immensely:—

Thus, (*Case* 21) a housewife incurs a severe fall on the back of the head, somewhat to the right side; then, for some weeks, is under treatment in the London Hospital, and an infirmary, whence she enters the asylum under my care; at and about which time she is incoherent, in a confused state, loquaciously recounting a medley of delusional notions, as if expressing dream-experiences; notions of hostility against her, of injury, and of the death of her family, jostling with vague fleeting notions of wealth; and the emotional phases rapidly changing, and expressed in tears or laughter, in quick succession. The physical signs are much as in general paralysis. The diagnosis recorded at the time of admission is that the case is one in which "the signs of general paralysis are simulated by brain-disorder of traumatic origin;" and the patient's recovery lends countenance to the accuracy of the diagnosis.

Another example is *Case* 22, who, about a month before admission to the asylum under my care, falls off a cab and injures his head, when drunk, and is taken to the Great

Northern Hospital, and thence to an infirmary. Injury to the head, an exciting cause, is operative on the basis of drink habit. Physical signs like those of general paralysis, fairly marked. Increased knee-jerk. Impaired memory, sombre feeling, depressive hallucinations, and delusions of hostility and endangered life. But the symptoms clear up much, the memory vastly improves, and now it is found that the patient does not spontaneously remember, and cannot recollect, his former delusions and hallucinations.

From the above sub-groups of cases we pass by easy transition to indubitable general paralysis from injury.

For *General Paralysis from Injury*¹ may occur also, and the cranial or other injury may be a predisposing or exciting factor thereof.

In some examples, at least, of traumatic general paralysis, we find one cerebral hemisphere much more affected than the other by "adhesion and decortication," by a greater extent and degree and duration of the other conditions of the cerebral lesion of general paralysis, including secondary wasting, and sometimes slight or moderate somewhat diffuse induration, and in some a state of lesion partially on the same lines as those of the cases already described at the beginning of this group under the head of convulsions, dementia, &c., following the brain-damage from cranial injury. In some, there are old meningitic thickening and adhesion-bands about the base of the brain and anterior mesial aspect of the cerebral hemispheres; and here cerebro-meningeal adhesion has in some commenced, or here, alone, has occurred; and blindness has often followed the optic-nerve implication in those changes. Secondary descending systematic spinal degenerations are frequent.

In others, the general distribution of the cerebral lesions, and of their respective degrees, in different parts, are of much the more usual type.

Traumatic general paralysis is sometimes marked by the relative predominance or striking nature of such violent

¹ Papers by the writer, *Journal of Mental Science*, Jan., 1883, p. 544; and same *Journal*, October, 1885. And work on "General Paralysis," 2nd edit., pp. 269 and 371.

aggressive symptoms as excitement, noisy raving, violence, destructiveness, in the earlier stages; vivid hallucinations of hearing and sometimes of other; or of all the special senses; often a long-antecedent change of character and disposition, irritability of temper, easily-evoked outbreak of wrath or violence. Here, the brain-lesions and wasting, often chiefly of the right cerebral hemisphere, have been accompanied during life by frequent, recurring apoplectiform and epileptiform seizures, with left hemiplegia, increased knee-jerks, and ankle-cloni.

Or, on the other hand, there are depressed symptoms of hypochondriacal or melancholic type, or delusive notions of hostility, poisoning, persecution, and hence aptness to quarrel or use invective may be unusually prominent.

Thus, in *Case 23* were vivid and horrible hallucinations and illusions of special sense; an irritable, morose ill-temper, the patient, full of hatefulness, cursing, reviling, or threatening for hours together, and monotonously so; right unilateral epileptiform seizures, followed by dextral hemiplegias together with a recurrently more impaired speech; delusional refusal of food; obstinate constipation; a tendency to Raynaud's disease (local asphyxial phase). The adhesion and decortication, and the brain-wasting, of the left cerebral hemisphere predominated over those of the right; the left being three ounces less in weight than the right; at the left posterior central gyrus, postero-parietal lobule, quadrate, and back part of paracentral lobule, was complete separation (when the membranes were peeled off) of the grey cortical substance from the white, and this occurred even at the bottom of the sulci. Heart degenerate. Kidneys, as old changes, capsular adhesions and ordinary cysts; as recent change, slight parenchymatous nephritis.

But expansive symptoms may be, or become, prominent in phases or throughout, and before and with them is the fundamental dementia. Increased tendon-reflexes and striking cloni often attend the later stages; with, or without, hemiparesis, and contracted limbs chiefly on the more paretic side. Pain in the head is, in many cases, severe, especially in the earlier stages. Dangerous, such patients

may be, prone to violence, suicidal, and even homicidal in bursts of excitement. Hallucinatory voices may threaten, or announce danger and ill to, the patient. These marked and protracted prodromes and earlier symptoms may eventually clear off, leaving self-satisfaction—but ever and anon come paralytic seizures of motor helplessness, with mental dulness and oppression, and incapability of writing and speaking, even as well as in the defective way usual to the patient.

Spinal Cord Injury a factor in mental disease.

In my own experience the cases have chiefly been general paralysis and paranoia. But many psychoses originating from spinal injury are psycho-neurotic conditions, built on the foundation of traumatic neurasthenia or hysteria. These last will be taken up presently under the fourth group.

At the moment of cord-concussion or injury the brain may be affected, at least by the propulsion and violent shake of the cerebro-spinal fluid; again, the vaso-motor apparatus of the brain may gradually become affected by the cord's condition: or the morbid process arising from injury may extend from cord to brain.

Case 24.—General Paralysis. Spinal injury, five years before admission, was soon followed by a liability to fits, and by giddiness. Had an early outburst of acute symptoms, with violence, smearing of room with fæces, exalted delusions of possessions and wealth. Later on, ordinary physical signs of general paralysis. Knee-jerk well-marked; fits starting in left hand; slight lead-line on gums, bad taste in mouth (is a painter). Large notions; busy, changing, expansive schemes; ready weeping about trifles.

Case 25.—General paralysis. Spine hurt two years before admission, by an elephant trampling on it. There was some evidence also of sexual excess and syphilis. At admission, were delusions about elephants, and the Emperors of Germany and Morocco, about detectives following the patient, and unseen people talking to him. He made allegations, also, of being abused and ill-treated by his wife and her friends, of being starved, and his home a wreck. Sombre

emotion and dejection. Slight physical signs of general paralysis, affected pupils (reflex iridoparesis, slight myosis), *quasi-tabetic* symptoms. Later on, self-satisfaction; an absurd project of going on the stage as an actor; an impracticable offer of presents to his wife.

*Case 26.*¹—General paralysis. Bad injury to spine, and to head over right parietal bone, six years before recognised insanity. The patient became feeble in health, mentally changed, slovenly, neglectful of duties and orders, depressed, discontented, made silly unfounded charges against those about him. Later on, he was restless, excited, irritable, noisy, mischievous, destructive to clothing, sleepless, peevish, sulky, dull, with outbursts of rage; gave absurd and confused orders; imagined and said he had placed others under arrest. Under my care, he had exalted delusions, and absurd delusions of ill-treatment, of starvation, of daily frightful corporeal injuries inflicted on him, of his life being threatened, and attempts made to poison him. Though at times buoyant, he was usually sullen and morose; often threatening and full of invective. There were hallucinations of sight and hearing; and muscular illusions as to the flight of his body. Once, temporary left hemiparesis, and once left facial paresis.

Case 27.—Paranoia. Some years ago incurred an injury to the spine by a fall, and has been affected by this, off and on, ever since. Has auditory, tactile, and thermic hallucinations and paræsthesiæ; delusions of being conspired against and persecuted by personators, who blow on him with blow-pipes in order to make a living out of him thereby, and who jeer and scoff at him, and conspire against him to benefit themselves. The gait is constrained and embarrassed; at every step one whole side of the frame is moved stiffly, and thus each side alternately.

Originating in spinal injury are some cases of the next group, also.

We resume the subject of the chief groups of mental disorder in *adult* life with *cranial* injury a factor.

IV.—The *Fourth* great group of mental disorders follow-

¹ Reported by present writer, *Journ. Mental Science*, Jan., 1883, p. 548.

ing injury consists of functional cases of a special type, and more frequently seen by the neurologist and surgeon than by the mental physician. In the more simple examples, indeed, the symptoms are predominantly "nervous" (in the restricted sense) rather than psychic. But in all cases an element of psychic perversion or failure is present; and in the more severe cases it takes the leading rôle in the morbid drama. Similarly-produced cases with definite organic cerebro-spinal lesions and symptoms find place in other of these groups, notwithstanding that they, also, are often attended by symptoms of traumatic neurosis, neurasthenia, or hysteria, described below.

In this fourth group, thus limited, come many cases following cerebral or cerebro-spinal shock; many examples of the traumatic neurosis which is engendered with especial facility should there happen to be a pre-existent neurasthenic or hysteric basis, but which may be produced independently of the pre-existence of these; and which, on the other hand, may become manifest as, or may occasion, traumatic neurasthenia, and subsequently on this basis, traumatic hysteria ("hystero-neurasthenia"), the building-up of a traumatic psycho-neurosis; for the mental elements are so striking that the state is as much a psychosis as a neurosis. Consequently, here come a considerable number of the examples of so-called "railway brain" or "railway spine," "spinal concussion;" "functional," "ideal," "psychical," paralyzes, &c., accompanied by psychic change, immediately occasioned by injury, which perhaps may be slight. In such cases the mental and cerebral conditions are supposed to be somewhat analogous to those of the somnambule phase of major hypnotism, in which similar motor, sensory and sensorial anomalies are easily produced by suggestion. For it is supposed that, after the injury, there is a cerebral state in which "suggestibility" is increased, and that the "traumatic suggestion" arises from the "traumatic shock" of the injury; the state of "general nervous commotion," or of "nervous shock" implying, or determining and securing, a cerebral condition and mental modification in which such "traumatic suggestion" easily arises; so that, mental spon-

taneity, will and judgment being obscured, the ideas of sensory and motor failure become realised, the temporary sub-sensitive and paretic states of the limbs due to, and forming the clinical phenomena of, "local shock" (which are hypæsthesia and paresis, even in the healthy) becoming—perhaps by the co-existent emotional perturbation—enhanced and transformed into complete paralysis, &c., initiated by a process of "auto-suggestion," and developed by a process of mental elaboration, in the unstable neurasthenic hypochondriacal anxious self-contemplating—or hysterical—condition of the mind of the subject of traumatic neurosis. And we find neurasthenia and hysteria in many cases to be the basis on which an injury, perhaps slight, leads, by those processes of mental elaboration and auto-suggestion, to grave symptoms, and eventually to a state of traumatic neurosis and traumatic psychosis.

The term concussion of the brain or cord seems to me to be capable of use, and to have been confusedly used, in three different senses :—

(1) As the manner of receipt of the injury (concussion as a cause, or in an ætiological sense).

(2) As the pathological condition of the organ, the primary, impalpable, undemonstrable injury thereof, inflicted by the results of the blow (concussion as a pathological effect).

(3) As the symptom-complex arising from ("2") that last-mentioned pathological condition of the organ (concussion as a clinical phenomenon).

Of these, the second seems to me to be the important one, and is the one I mean when speaking of concussion, unless it is otherwise specified. "Shock," or "nervous shock," may be used as depression or exhaustion of the cerebro-spinal nervous system by some sudden impression or violence.

The chief symptoms of the hystero-neurasthenic group are intellectual perversion, emotional dejection, sombre sad ideas, failing power of volition, petulant irritability or rage, headache, insomnia, sexual weakness, spermatorrhœa, and sacral backache.

With hysteric hemianæsthesia usually go contracted visual field and achromatopsia. On the other hand, severe bladder-troubles, reflex irido-plegia, and optic nerve atrophy point to organic changes.

When the physical cerebral or cerebro-spinal shock from external violence has been more considerable—after the symptoms of the primary shock (namely, bewilderment, mental confusion, and perhaps a quasi-somnambule automatic state) have passed off; then, when consciousness returns, come those symptoms which are preliminary to the traumatic neurosis or overt psychosis—viz., loss of memory of the life between the moment of accident and the return of full consciousness (after the period of defective consciousness a moment ago described), and sometimes retrospective loss of memory of a space of time immediately preceding the injury; also back pains from sacrum to nape; headache; malaise; uneasy disquietude: insomnia.

Next come the symptoms of the overt psychosis—melancholia, often of hypochondriacal type, with great irritability. Sadness, dejection, indifference to friends and family, distress, oppression, sombre feeling, rising into fear, and culminating, perhaps, in seizures of terror or in suicidal attempts; despair (often with præcordial pain, oppression and palpitation). Agitated, variable, fickle and tumultuous emotional changes; vivid and terrifying recollections of the accident or injury, terrifying dreams anent the same. The patients are easily agitated easily mortified, abnormally sensitive to impressions from without—*e.g.*, they are perhaps easily thrown into emotional and physically-expressed tumult by ordinary noises. Frequent, are self-study as to symptoms and concentration of mind upon them, irritable irascibility, anxiety, inclination to delusive notions as to being annoyed; vague, torpid, confused, easily fatigued mental operations, hence a careless slipshod way of asking or answering questions; failing general memory, or lacunar memory; failing and easily fatigued attention, rapidly-coming confusion in reading; silence, slow replies, volitional limitation, hallucinations, insomnia; severe loss of memory, possibly even of patient's own name.

Irregular and intermingling anæsthesia and hyperæsthesia of cutaneous, or of general, sensibility, or of special senses, or of all these, and often of hysterical hemianæsthetic or hypæsthetic character, in zones or segments and not following the course and distribution of nerves; sometimes impaired muscular sense, analgesia, contracted visual fields, a- and dys-chromatopsia, cloudy vision from paresis of accommodation, impaired hearing, dull heavy back-pain, constrictive head-pain—increased by intellectual effort. The pains are usually heavy, obtuse, and worse on movement. Sparkles, flying spots, or colour-play, before the eyes; noises in the ears, hyperacusis; morbid tastes and smells; spinal tenderness; paræsthesia—*e.g.*, morbid sensation of heat or cold or formication.

Defective motor power, irregularly distributed; paralysis, perhaps of limbs on same side as injury. If hemiplegia is present, the face and tongue are not affected, nor is palsy of any cranial nerve at all frequent; it often is more marked in the leg than in the arm, and often with it is partial or unilateral anæsthesia; or there may be palsy of a segment of a limb only. Usually the paralysis is flaccid. The muscles may be wasted, and their electric excitability be quantitatively diminished. The gait may become timid, slow; with short steps, feet wide apart, stiff trunk, frequent halts, and often much tremor. Tendon reflexes usually increased. Tremor, spasm, vertigo. Perhaps sluggish unequal pupils. Speech slightly slow, explosive, interrupted; or, in some cases, ceasing temporarily from forgetfulness.

Sometimes vaso-motor rapid changes, and heightened cardiac impressibility, *e.g.*, attacks of palpitation, quick pulse, flushed face, dilated pupils; or, attacks of sweating of the axillæ, with rapid pulse, reddened face and chest; and blue tint of the palsied parts.

Anorexia, disordered digestion, failing nutrition, failing virile power, polyuria, glycosuria.

Thus, in the foregoing paper, I have described four great groups of cases in the *adult*, with *cranial* injury a distinct traumatic factor in mental disease:—the first con-

sisting of ordinary forms of functional psycho-neuroses ; such as a form of mental automatism, stuporous insanity, acute and subacute hallucinatory insanity, and melancholic depressed states ; the second comprising paranoia and its immediate congeners ; the third group constituted of traumatically-caused severe organic brain-disease, with dementia, or other mental conditions, and, often, convulsions, paralyzes, or other motor, and various sensory and sensorial, phenomena ; the lesions being either local gross destructive ones, or those of chronic cerebritis, or sclerosis, or of cerebral atrophy—perhaps chiefly unilateral—or those of general paralysis of the insane ; and the fourth group consisting of functional cases of a particular type.

Partly in addition to the numbered cases, the clinical and necroscopical descriptions and summaries relating to the first and third of the above great groups are entirely drawn from my cases ; those relating to the second group are almost entirely so ; whilst, as regards the fourth group, I have utilized cases under my care, and cases under the care of others, as well as the descriptions of Erichsen, Herbert Page, Charcot, Oppenheim, Clevenger, and Blocq.

The numbered cases were all under my care, and I have purposely limited the descriptions of them to very concise summaries of the principal clinical or necroscopical features.