

took a hint from that case which I put into practice in my next," and he tells how he applied the forceps to the sides of the head and forced the head to rotate forward, and the result to the mother was very satisfactory. In my own practice the same rotation is invariably carried out but not with the forceps. It is not difficult, as has been intimated by the reader, to rotate the head forward, it is one of the easiest and most satisfactory things to do in obstetrics. You have only to carry etherization to a satisfactory degree then introduce the entire hand and seize the sphere which presents in the palm of your hand, and nine times out of ten, even with fingers as short as mine, you can touch the forward shoulder and with the finger turn the body with the utmost facility. Not once have I failed, and gentlemen here can attest to more than one case in which they have sat all night waiting for nature to turn the occiput, I have been called, the woman etherized and in fifteen minutes delivered of a living child. Assistance can be rendered by the unoccupied hand by palpation over the woman's belly. The satisfaction I have had in relieving gentlemen who have sat all night waiting for these cases has been greater than that I have experienced in any other department of practice.

DR. BOISLINIÈRE, St. Louis, Mo.: The recognized position of the occiput is backward. Naegelé teaches that the frequency of the position of the occiput is first to the left anteriorly and last in frequency to the right posteriorly. He says that out of 100 cases of vertex presentation, the occiput was 70 times to the left anteriorly and 27 times to the right posteriorly, and there is no better authority in obstetrics on this matter than Naegelé. The fact of the occiput having been found often to the right posteriorly and having rotated to the right anteriorly, the Doctor denies the possibility of, because probably he has met with the difficulties I mentioned, in his cases. Either the sacrum was very flat, the spine of the ischium projected so much into the cavity of the pelvis as to prevent the forward rotation. The spines of the ischium have a great deal to do with the rotation of the occiput forward. I appreciate the Doctor's remarks very much, but in his cases I believe the spine of the ischium has prevented the anterior rotation of the occiput, or there has been a very flat sacrum, or a very large sacrum, else one of the factors have been wanting, there were not enough uterine contractions and probably the floor of the pelvis had been ruptured by previous labor or was very much relaxed. I have attended between 8000 and 9000 cases of labor and have frequently seen the occiput face posteriorly to the right and rotate to the right anteriorly, but it requires a strong pelvic floor and no opposition from the spine of the ischium and labor favored greatly by the efforts of nature. Of course the rotation is very painful. In all my practice I have never ruptured a perineum. I think the Doctor's method is allowable only in cases of multiparæ. I do not think you can use the whole hand with a primipara, where the perineum and vagina are very small, unless you first perform episiotomy. The Doctor's method is excellent when the woman has had children, the perineum is large and the child small.

DELIRIUM GRAVE.

Read in the Section on Practice of Medicine, Materia Medica and Therapeutics, at the Thirty-Eighth Annual Meeting of the American Medical Association.

BY E. C. SPITZKA, M.D.,

OF NEW YORK CITY.

Synonyms.—Delirium Acutum, Mania gravis, Typhomania, Bell's Disease, Délire aigu, Manie grave, Phrenitis.

The disorder I am about to consider, owes its importance not so much to its frequency as to the fact that it furnishes opportunities for grave yet excusable errors in diagnosis. It may fall to the lot of the general practitioner to see but a single case in a life-time. But that very single occasion will prove a memorable one. On the one hand his diagnosis will oscillate between typhoid fever, meningitis, sunstroke and hydrophobia. On the other he may be misled, through the occurrence of lucid intervals, to predict the recovery of a patient, who is in reality suffering from one of the most malignant and fatal affections of the nervous system to which mankind is liable.

The nomenclature of acute fatal delirium reflects this great uncertainty. The ancients spoke of it as *Phrenitis*, a curious term which still finds a place in certain vital statistics. Abercrombie described an "inflammatory paralysis of the brain"—a term which is quite as good a one for a certain group of cases as any used. According to Bell, alienists who occasionally saw cases of this disorder, classed it as a very acute and intense form of maniacal delirium. Clouston, as recently as two years ago, illustrated this opinion of Bell by describing a typical case as one of acute mania in his "Lectures on Mental Diseases." The former an American writer, struck by the remarkable resemblance of the symptoms to those of adynamic typhoid delirium, devised the excellent name, *Typhomania*. The French gave it the non committal designation, "acute delirium," which, owing to its ambiguity, I have proposed to change to "grave delirium."

The writers of the last decade assumed that grave delirium was a clinical entity. Schüle, Krafft-Ebing and I have assigned it a special place in psychiatric classification. Serious objections exist to placing all cases manifesting such delirium in the same category. Fürstner, Mendel and others have shown that cases having the most different origin, may resemble each other in the final stage, and they demonstrate that Jehn and Schüle were thus misled. The experience of physicians limited to cases received in asylums does not cover all phases of the disorders in dispute. Many are received in general hospitals in a moribund condition, or soon die there, others are treated at home, on the theory of isolation or essential fever. Exceptional opportunities enjoyed by me during the past eleven years, and obtained in part through the courtesy of my lamented friends, T. A. McBride and Wm. A. Hardy, enabled me to review the subject in the light of altogether thirty-one cases of real and spurious delirium of this order.

¹ Brière de Boismont, op. cit.

I shall first describe the typical form:

The previous condition of most sufferers from grave delirium is usually poor. General nutrition is impaired, and there is an obscure malaise, comprising ill-defined nervous and slight gastric disturbances. Sometimes the outbreak of the disease is preceded by from four to six weeks, by a matutinal headache. This is described as a feeling of tension and often associated with vertigo. The patient is irritable; light, sound and in some cases even odors annoy him. Sleep is disturbed. He finds it difficult to collect his thoughts; he feels conscious that he is morbidly emotional, but is unable to restrain this, and in a remarkably large proportion of cases there is a sense of some impending misfortune.

The onset of the disorder may be so sudden and accompanied by so total a subversion of the mental and physical powers as to suggest the fulminating type of epidemic cerebro spinal meningitis, or the action of a violent nerve poison. The patient while walking on the street, suddenly totters and if he do not fall stumbles about aimlessly like a drunken person. At other times, while taking refuge from the impending misfortune dreaded by him, the sufferer breaks out in violent acts, which are, however, rather manifestations of anxiety than of aggressiveness. He clutches at those about him, tearing their clothing or hair and then delirates about his enemies, refuses food because it contains poison, complains of crawling vermin, has hallucinations of policemen, negroes, or of multitudinous images of a more frightful character, such as toads, snakes, bugs, goats and horses' heads, "with flaming eyes." Such visions cause him to pause in his delirious talk and to look in an alarmed or threatening manner at certain parts of the room. In some cases the visions are of a pleasant nature, and the accompanying delirium may be of an ambitious, religious or erotic tinge. Flaming spectra of angels, numerous husbands and countless lovers are seen, and in the midst of ecstatic contemplation, the patient starts, awakened by the voice of God or of a paramour, who delivers flattering missives in a voice of thunder or a glare of celestial light. Sometimes the terrible and pleasant alternate in the history of the same case. In that event corresponding changes in demeanor of a most dramatic character are noticed. The attitude of a timid hunted victim gives way to theatrical gestures, and exclamations of terror to praying, singing and whistling. In the erotic form, obscene gestures are indulged in, and the genitals are manipulated either automatically or with a definite purpose. Rapid changes of this kind are particularly observed in females. At one time such patients will dance and jump around laughing immoderately and vociferating; at another they will be found dissolved in tears, or try to escape from their imaginary foes with an air of intense anguish.

A noteworthy feature is, that even with this violent onset, there are periods of relative lucidity and apparent health, in which the patient may recognize his delusions and hallucinations, perhaps try to explain them away, by admitting that he has been drinking too much, or may voluntarily consult a phy-

sician. But in the latter event the uncontrollable nature of the disorder exhibited a sinister illustration in one of my cases. The patient complained of something "funny" in his head, said that everything seemed confused and that there was a load on his chest. But while dilating on the latter feature he suddenly exclaimed, "they want to burn me," "poison is in this atmosphere," "keep me in your office, doctor," "I am crazy, and they want to take me to an asylum." Then he passed into the wild delirium characteristic of the height of the disease.

The development of the disorder takes place amidst increasing insomnia. The flight of ideas becomes wilder, but more stupid. True remissions no longer occur in the delirium, but there are spells of quietude due to exhaustion. Indeed it is remarkable that with the unceasing raving and motor activity at this stage, fatal exhaustion does not close the history of the case thus early. The patients roll around, kicking, grinding their heads against the wall, twirling, rubbing or beating their hands so as to actually mangle them; and maintain the most singular and uncomfortable positions for hours and days. Speech becomes more and more indistinct, and there is as kaleidoscopic confusion of syllables and words as of ideas.

At the acme of the disease thus developed, everything about the patient indicates that he is suffering from something more than a mere mental disturbance. Every symptom attests that he is the victim of a profound bodily disease. The head is at first hot, the conjunctivæ injected, the expression is stupid and the face suffused and turgid. Later on cyanosis often sets in. The carotids may appear to throb violently, but in reality cardiac action is extremely feeble, the pulse being filiform, easily compressible and ranging from 110-160. It shows a striking parallelism with the temperature. The latter is high, running from 101° to 104°, but in the stage of collapse, and those spurious remissions due to collapse, often becomes subnormal. The pupils are in most cases dilated, myosis is occasionally observed, and while light reaction is commonly unimpaired, it is sluggish in a few cases. The expression of the countenance is peculiar. In some, particularly those who indulge in obstinate mutism the eyelids and lips are tightly closed, and every attempt to open them is firmly resisted. Others keep their eyes fixed on a special point, such as the gas-fixtures, making all the while a peculiar blowing motion with the mouth and cheeks, with more or less regularity and with no conscious purpose. As dissolution advances, the features become drawn, giving an indescribably sad expression.

The delirium which has given its name to the disease, is either wild or rambling. It may continue in any of the channels indicated at the outset, being accordingly either aggressive, expansive or depressive. As the disease progresses it becomes more and more monotonous, and is often limited to one subject. Soon this monotony extends to the mode and form of expression. The faculty of expressing himself, even in broken sentences becomes lost, and the patient, after passing through a period of syllable

confusion, makes meaningless sounds which are endlessly repeated. Still, even amidst this wreck of the mental mechanism, a predominant idea can be occasionally discovered. In one of Brill's cases, the name of the girl's seducer, in another, one of my own, the occasion of a quarrel which had been the exciting cause of the disease, and in a third the name of the Deity, were repeated in an impressive manner until utterance failed. Undoubtedly much of what is represented as insanity in romance, is based upon a picture of grave delirium, perverted by lay tradition.

Indications of illusions and hallucinations are frequently observed. One of my patients insisted on the removal of a pair of legs which he claimed were in his bed. Another yelled that they were drowning him in something that smelled like benzine, a third picked off the "crabs" with which he imagined himself to be covered. With this there is extreme motor agitation which ultimately becomes aggravated until a most unprecedented form of automatic violence is developed. Cases are on record in which the patients literally converted themselves into one continuous bruise, others in which they picked, chafed or rubbed their matting and bedding into furze. They may bore away at the sides of their room with their heads until the plaster is worn away, or break out in blind and purposeless motor delirium, kicking, striking and developing force that half a dozen skilled attendants may fail to restrain the sufferer. Others will indulge in less aggressive acts. These will stamp on the floor as if laying a Belgian pavement, continue making salaams for days, or rub a finger-knuckle against their teeth until the bone is exposed, or the joint actually gnawed off. In one case described by Sander the patient, a young girl, had torn her perineum and made great rents in her vulva. These movements which occupy a position intermediate to the clonic spasm and automatism, are variegated or interrupted by tonic spasms. They result in strange bodily contortions, resembling, though not identical with, those found in tetanus. The maintenance of such uncomfortable positions for days at a time indicates a profound degree of anæsthesia. In some cases the hand is *main en griffe*, the nails being pressed so tightly into the palms as to cut the latter. In a number of patients there is a tendency to bite, and this tendency is so strong that in default of foreign object one such patient bit off his tongue. It is this class of patients who exhibit a terror of water, and undoubtedly many cases of so called hydrophobia were naught else than cases of grave delirium. To the best of my knowledge it is the only genuine hydrophobia in human pathology. In a few instances peculiar forms of disturbed sensation, in addition to the anæsthesia already referred to, are observed. In the event of pruritus patients may scratch their entire bodily surface until it becomes eczematous. In the majority there are suggillations due to surgical causes, and these, owing to the depressed vitality of the patients, look like the hypostatic marks of dead subjects. To add to the corpse-like appearance entailed by this terrible disease, the extremities become cyanotic and

cedematous. In addition, herpes, bullæ, pemphigus, pustules and phlegmonous inflammations have been noted.

As regards the somatic functions, those of the stomach are most constantly disturbed. There is always a pronounced oral *jator* and frequently bilious vomiting. The appetite is ordinarily impaired or entirely destroyed, and the patients will reject the food after it has been placed in their mouths and spit on that which is still in the dish. Pulmonary oedema often occurs. In no case that I have observed, nor in any one reported by others, were the catamenia suspended or even delayed. In this respect there is a marked difference between grave delirium and the typical acute forms of insanity.

Death usually takes place quite suddenly, sometimes while the patient is yelling; at other times in coma, and is then preceded by *subsultus tendinum*. In those cases which were carefully observed in the moribund period the symptoms indicated exhaustion of the oblongata. Intermission of the pulse, hicough, dysarthria and difficult deglutition are then noted. The hydrophobia previously present may give way to thirst, though the patient be unable to swallow.

It is a surprising fact that in the midst of the very acme of a disease manifesting the severest lesions of consciousness, those para-lucid intervals should seem, which I have already commented on, as inexplicable features of the initial phase. Even here the wandering and delirious attention may be fixed, the patient brought to recognize that he is ill, deranged, in a hospital, and that his interlocutor is a physician. Yet, cases are reported in which such an interval lasted four days and the temperature went down. But the physician must not be misled into giving definite assurance of recovery. In a few hours the scene changes, and the march to the fatal termination is resumed. Death may even take place in the very midst of a lucid interval, and no more touching circumstance can be experienced in medicine than to witness the mother of a family, who has passed through the mental hurricane of acute delirium first reduced to a level lower than that of the brute, to return to nearly full consciousness a few hours before death, cry over the escapades, she infers rather than remembers, having been guilty of sending for her children to take leave of them, and apologizes for the trouble given the nurses, to whom she makes a few appropriate presents. If any fact in the history of grave delirium convinces me that it is not a form of ordinary insanity, but rather a somatic condition of which the delirium is a symptom, it is this very one.

The causes of grave delirium may be summed up as consisting in an inherited or acquired predisposition, to which some exciting cause, such as will deeply affect the emotional faculties, or otherwise vitiate the nutrition of the nerve elements and determine congestive hyperæmia, is superadded.

I have tabulated 11 of my cases in which the history was nearly perfect, and 19 of which good histories here furnished by other writers, making 30 cases in all. The following tables accordingly show the influences of predisposing and exciting causes:

TABLE SHOWING FAMILY HISTOR.

	Males.	Females	Total.
Insanity in direct ancestry.....	.....	4	4
Insanity in uncles, aunts, sisters or brothers.....	2	10	12
Normal family history.....	2	6	8
Not stated.....	1	5	6
Total.....	5	25	30

Of 20 known 16 had heredity.

TABLE SHOWING INDIVIDUAL HISTORY.

	Males.	Females	Total.
History of previous attack of insanity.....	.....	7	7
History of feeble-mindedness.....	1	2	3
History of ugly, excentric or excited temper.....	2	1	3
History of alcoholism.....	1	1	2
No abnormal features.....	.....	5	5
Not stated.....	1	9	10
Total.....	5	25	30

Of 20 not known 17 had acquired disposition.

TABLE SHOWING EXCITING CAUSE.

	Males.	Females	Total.
Angry excitement.....	1	5	6
Fright and angry excitement.....	.....	1	1
Religious excitement.....	.....	1	1
Seduction.....	.....	2	2
Depressing emotions.....	1	2	2
Overstrain.....	1	.....	1
Alcoholic excess.....	.....	1	1
Insolation alone.....	.....	2	2
Insolation and worry.....	.....	1	1
Not stated.....	2	10	13
Total.....	5	25	30

Of 29 known 13 had emotional causes.

Regarding the age of these patients, which is stated in the case of 27, I find the youngest, a female, to have been 18 at the time of her death (Fronmüller), and the oldest 50 (Clouston). Four are 30, three 34, two each, 37, 28, 27 and 26. The largest number, eighteen out of twenty six, were between the 26th and 37th years inclusive. The average age was $34\frac{1}{2}$ years.

It is noteworthy that only one sixth of the cases were of males.

As regards the duration, in twelve cases where it was accurately known, it was nearly fifteen days, dating from the outbreak; the longest being nineteen, and the shortest six days. Schüle speaks of cases lasting but a single day, but he confounds so many different conditions under the head of acute delirium that, in the absence of confirmatory experience, I do not feel inclined to attach much weight to this statement.

As to the prognosis, it may be regarded as almost invariably unfavorable. Very few indeed recover, and then they pass through an intermediate period, of which dementia, and what I term focal amnesia, are the characteristic features. With one exception, the recoveries reported were of persons in whose history alcoholism or hysteria were prominent factors. That one exception occurred in this country and was reported by Dr. Harriet Brooke, assistant physician at the insane department of the Pennsylvania Hospital. As it is the only case in which the symptoms were well marked, characteristic, and in which the morbid condition reached a high degree, that recovered,

I will make the only reference to therapeutics which this paper is to contain, in connection therewith. Morphine, which is of excellent effect in analogous conditions, is so utterly without influence on acute delirium, that what would, under ordinary circumstances, be toxic doses, can be given without even affecting the diameter of the pupil. The only procedures that have any useful influence are those employed to combat the threatening collapse. Hypodermics of ether have been used by me with excellent effect, and, as in congestive parietic dementia, ergotin exerts a beneficial influence. In Dr. Brooke's case both were given, the latter in combination with digitalis, a dose of croton oil administered, a large mustard plaster applied over the pericardium, and as soon as the oil operated, reaction from what threatened to prove a fatal collapse was established. Of course, a tonic and nutritious diet are necessary adjuvants to such a plan of treatment. But it is usually rendered impossible by the patient's refusal to eat, and if he eat, by the low state of his digestive and assimilative functions.

There is one condition which is most easily confounded with grave delirium, and that is the so called nervous or ataxic form of typhus. This disorder is characterized by delirium, somnolence, stupor, and muscular tremor of an excessive character. The presence of petechiæ, albuminuria, and the great cardiac enfeeblement increase the resemblance. If we bear in mind that this form of typhus is most apt to occur in those cases in which depressing causes have acted on the nervous system, we will understand how even the etiological history of the case may mislead the diagnostician. A characteristic eruption may be absent, the temperature may fail to furnish us with a reliable guide. In these events, the presence of an epidemic, the initial chill, great thirst and the predominating muttering character of the delirium, are our only means of establishing the existence of essential fever.

Analogous conditions are observed in typhoid fever. Exceptionally cases occur in which there is an initial delirium of such character and severity that the sufferers are sent to the insane asylum under the mistaken view that they are suffering from a strictly mental disorder. As in grave delirium, paroxysms of screaming and violence may occur. There are also sudden changes; the patient who at one moment attempts to jump out of the window, the girl who calls for a baby, or begs to be taken home, may rapidly subside into, muttering delirium, coma and death. Lucid moments are equally noted. The exact and collateral evidences of typhoid are, however, less variable than those of typhus, and a diagnosis by exclusion is less difficult.

There is a disorder, extremely rare, it would seem, which is termed acute grave hysteria, and which I should be sorely puzzled to differentiate from grave delirium. Such cases, carefully observed during life, and analyzed post-mortem, are reported by Meyer and Fronmüller. I have myself seen two, in which the hysterical character was most marked, and the temperature rose nearly to 103° . In one of these there was a fatal issue. The girl, depressed by moral

influences, exhibited spasms of face and eyes, lay speechless, refused food at times, and thus continued for nearly two weeks. Then she suddenly developed restlessness, threw herself around in a peculiar way so as to lie across the bed, had crying and laughing spells, tremors of the extremities, aphasia, mutism and total anæsthesia. There was mydriasis. Consciousness, which was impaired as a general thing, was fairly clear at intervals. In the fifth week of her illness, while in a crying and laughing spell, she suddenly expired. Of course, the predominance of motor symptoms at the outset, and the crying and laughing spells, spoke in favor of a hysterical disorder. Those who saw the case with me had already given a favorable prognosis. I diagnosed grave delirium and gave an unfavorable prognosis. My chief ground was the high temperature. But I have since learned that a temperature of 102.5° is occasionally reached in the severer form of seizures occurring in the course of benign hysteria.

In a number of cases a series of symptoms, not unlike acute delirium, has been demonstrated to have resulted from multiple infection of the brain due to ulcerative endocarditis.

A few cases have also been described in which the results of a blow on the head, in a chronic alcoholic, during the prevalence of an epidemic of typhoid fever, and an ordinary suppurative meningitis, breaking out from some cause not distinctly traced in a person who had received a blow a long time before, accurately imitated the course of acute grave delirium. If all these considerations did not prove that this symptom group was merely the terminal phase of a number of affections having this much in common, that the brain is alike overwhelmed in all by some severe and multilocal morbid agent, the anatomical evidence would seem to establish this proposition beyond a peradventure. Cysticerci, when scattered in large numbers through the brain, have produced motor and mental symptoms not unlike those related. Extremely acute cases of parietic dementia, which is a multilocal schirro-encephalitis with vaso motor episodes, resemble it so closely as to have been confounded with grave delirium by Jehn and Baillarger. Finally, I have observed a case in which I was able to demonstrate—crudely, it is true, for the methods of that day were such—that a case of delirious mania with paralytic symptoms was due to the presence of miliary foci, containing a capillary as a centre, surrounded by disintegrated brain detritus, and this in turn by a zone of invasion of micrococci. Fürstner found that the blood of those who suffer from that form which leads patients to asylums presents a peculiar consistency. When removed from the finger during life, it is found to be of a remarkably dark color. On microscopic examination numerous bodies presenting the character of detritus are found. Contrary to what is the rule with dark blood, its fibrin coagulates rapidly and *en masse*. He also found a peculiar condition of the muscles; these are brownish and exhibit exquisite amyloid degeneration, a change which, as is well known, occurs also in typhus, variola, pneumonia, puerperal fever, epidemic meningitis, and traumatic or rheumatic muscle disease. This author

does not find noteworthy organic brain changes; but in just such cases as those described by him, but lasting a little longer, Clouston describes a deposit of new material all through the gray matter. Fütterer found fifteen grayish yellow foci, visible to the eye, located at the junction of the gray and white matter. In a beautiful case of this kind I found hyaline and fibrinous exudation throughout the same districts, ten years before Fütterer's paper was published. Like him, I had regarded them as the result of thrombotic stasis. I may add that attempts to cultivate the bacilli found in the blood in this disease, by Briand and Marcel, failed.

On reviewing the entire evidence relative to grave delirium in the narrowest sense of the word, we find the following facts prominently established:

1. It attacks persons whose hereditary tendency involves what may be biologically regarded as a chemical, that is a nutritive instability of the nerve elements.
2. The exciting causes are either functional abuses or external influences of a kind which would aggravate such instability, and overburden the metabolic capacity of brain tissue.
3. The blood and muscles exhibit pathological conditions closely resembling, in the latter case, those found in zymotic disease.
4. All we have to assume is that, in consequence of the defective chemistry of an invalid brain, and its inability to meet the emergency of the exciting cause, some chemical body is formed which is at once toxic to the new elements, and changes the constitution of other important structures. In other words, grave delirium is to be regarded as a self-intoxication analogous to diabetic coma.

Whether the toxic agent be a ptomaine, or something analogous to the chemical body which Meynert, in a beautiful theoretical exposition, suspected the existence of in epileptic coma, comparing it to the cyanides, I am unable to say. The structural changes in the brain are altogether secondary; they may aptly be compared to those resulting from alcoholic excesses. An alcoholic excess may prove fatal, but no structural changes result from a single such excess. A series of excesses extending over a long period of time may, however, produce degenerative and vascular lesions. Similarly, the intense poison of grave delirium may prove rapidly fatal, and no characteristic lesion-changes be found after death, while in cases of longer duration, secondary results of hyperæmia and sequential stasis, modified by the peculiar state of the blood itself, are left to attest the malignant influence of the mysterious poison to which this terrible malady must be attributed.

[A full account of the morbid anatomy and pathological theory of this disease is given by the writer in the *Transactions of the American Neurological Association* for the current year.]