

of syphilitic origin. Jaborandi has been successful in Laycock's hands, ergotin in those of Ringer and Da Costa. Valerian has been beneficial but not curative (Trousseau). Galvanism has certainly been of signal service in several cases, applied by one electrode to the neck below the occiput and the other to the hypochondriac regions in turn. From the point of view of the experience thus far gained, the following plan seems most promising: A course of iodide of potassium should be at first administered. The disease not yielding, galvanism should be used, and pilocarpine and ergotin should be tried successively if the first fails. Warm clothing should be worn, and a warm winter climate should be selected if practicable.

ALCOHOLISM.

Definition.—By the term *alcoholism* is meant the physical and mental changes induced by alcohol. The effects of a large quantity taken in a short time are known as *acute alcoholism*, and the term *chronic alcoholism* is applied to that state which is the product of the long-continued action of considerable quantities of the poison. *Mania a potu* is a delirium caused by the action of alcohol in large quantity in certain susceptible subjects: it is an acute alcoholic delirium. *Delirium tremens* is a delirium with trembling, occurring in the course of chronic alcoholism, and is often induced by bodily conditions, as stomach derangement, which prevent the introduction of the accustomed stimulant. Usually, however, these terms are applied indiscriminately to both kinds of cases.

Pathological Anatomy.—**ACUTE ALCOHOLISM.**—The mucous membrane of the stomach is more or less red—often vividly so—from hyperæmia. The redness is not usually universal in the stomach, but in patches, the mucous membrane about the cardia being chiefly affected. There are, also, cloudy swelling and more or less detachment of the epithelium. Here and there are occasionally ecchymoses, and still more rarely ulcerations, which form in the lower part of the œsophagus and in the stomach. A more or less intense hyperæmia, also, is evident in the mucous membrane of the trachea and bronchi. The lungs present the changes due to hypostasis, and less frequently of hepatization. Similar conditions are found in the brain. The membranes are more or less deeply injected, the *puncta vasculosa* more numerous than in the normal, and an œdematous state of the pia, of the perivascular lymph-spaces, and of the brain-substance itself, exists. It is the condition, indeed, known to morbid anatomists as a "wet brain."

CHRONIC ALCOHOLISM.—There are but few organs and tissues not in some way changed in this condition of the system. The mucous membrane of the intestinal tract presents the usual evidences of chronic

catarrh. The connective tissue, especially around the tubular glands, undergoes hyperplasia, and, in contracting, subsequently encroaches on the caliber of these glands, which in consequence atrophy and degenerate. The mucous membrane is at first thickened, in consequence of the overgrowth of connective tissue, but the subsequent contraction leads to atrophic changes, to shrinking. Extravasations of blood now and then occur, and, in the transformations which ensue, appear finally as patches of pigment, rather thickly disseminated throughout the organ. Very frequently superficial ulcers—erosions of the follicles—take place. The sub-mucous connective tissue always undergoes hypertrophy. The cæcum next to the stomach is the principal seat of these changes. But more important even are the changes taking place in the liver. This organ may be found enlarged, with its connective tissue in a state of active hyperplasia, or shrunken, nodulated, and hard, in the condition of sclerosis, or it may be more or less advanced in fatty degeneration. These changes have been already described under their appropriate heads, and need, therefore, only to be mentioned here. Hyperplasia of the connective tissue of the kidneys and subsequent contraction also take place, forming the condition of chronic interstitial nephritis; but this is not so frequent a change as the corresponding disease of the liver. The constant presence of alcohol in the blood alters its constitution in that it contains an excess of fatty matters, the minute vessels undergo atrophic changes also, and the functions of the sympathetic are depressed, so that local congestions are apt to ensue, as in the lungs. The walls of the veins sometimes undergo great thickening, encroaching on the lumen of the vessels. The muscular tissue of the heart may undergo fatty degeneration,* and in the circulatory system there ensue, earlier and more advanced, the senile changes of later years. Not less important are alterations in the structure of nervous tissue. The neuroglia of the brain undergoes hyperplasia, the ganglion-cells atrophy, the perivascular lymph-spaces are dilated, the vessels are atheromatous. The final result is, that the brain-substance is firmer, shrunken, and the vacant spaces are filled with fluid. These changes are not equally advanced in all cases, nor do they always exist together, but in old subjects of chronic alcoholism they will be found in various degrees and stages of development. The membranes are also affected in various ways and to different degrees—opacities, thickening, exudations, etc., being by no means uncommon. Pachymeningitis, with hæmatoma, is now understood to have its origin in chronic alcoholism. This condition may, indeed, be induced experimentally in animals—in dogs—by feeding them a long time alcohol with their food.† Similar changes occur in

* Dr. A. Baer, "Der Alcoholismus," etc., Berlin, 1878, p. 67.

† Kreminansky, "Ueber die Pachymen. int. hem. bei Menschen und Hunden," Band xlii, pp. 129, 321, Virchow's "Archiv."

the neuroglia, in the vessels, and in the ganglion-cells of the spinal cord.

Symptoms.—ACUTE ALCOHOLISM.—The condition of alcoholic intoxication is too familiar to require description here. The symptoms of profound intoxication, short of lethal, however, are important, if for no other reason, for the intricate diagnostic points involved. When a large quantity of some alcoholic fluid is taken, the stages of excitement and of rambling, with incoherent muttering, are soon passed; the power of voluntary control is lost, and complete muscular resolution takes place, and the patient lies unconscious, relaxed; urine and fæces discharging involuntarily. The face is bloated, congested; the lips swollen and purplish in color; the veins of the face and neck distended; the conjunctivæ injected, the pupil contracted, no reflex movements excited by touching the cornea or titillating the fauces; the breathing slow, stertorous, and shallow, with puffing expiration, and the pulse feeble and slow. Such is the condition in severe cases of alcoholic intoxication. A man so affected is said to be "*dead drunk*." There are, of course, various gradations in the severity of the symptoms, in the lesser degrees of drunkenness. In some subjects, a sudden indulgence in considerable doses of alcoholic fluids—an outbreak into a debauch—excites a form of acute mental derangement—*mania a potu*, or acute alcoholic delirium*—which is confounded with *delirium tremens*; but for the production of the latter disease chronic changes due to alcohol are necessary. Acute alcoholic delirium, on the other hand, is due to the immediate impression of the alcohol on the brain of a susceptible subject—usually a young man having strong neurotic tendencies.

ACUTE ALCOHOLIC DELIRIUM, or *Mania a potu*.—This condition is usually confounded with *delirium tremens*. It differs from it, however, in that it is the direct result of alcoholic excess, in a subject free from the numerous changes of chronic alcoholism. Those suffering from this malady have been engaged in a sudden debauch, or have drunk liquors very deeply for a comparatively short time. Besides the sudden and great excess in drinking spirits, they have usually been subjected to some powerful mental excitement, to mental worry, to chagrin, etc. Under the influence of these causes, they grow more and more excited, become wakeful, lose their appetite, and presently become the prey of hallucinations. The delirium is similar in character to that of *delirium tremens*, but the trembling is wanting, the complications of the latter are not present, and the termination is earlier. The delirium may be as violent as that of *delirium tremens*, but it is not so important, and a prompt cure may be readily effected. It is true, now and then, that such a case terminates in mania when occurring in

* Magnan, "On Alcoholism," translated by Dr. Greenfield. London, H. K. Lewis, 1876.

a subject having strong proclivities in that direction. Usually, the prompt withdrawal of the offending cause, proper alimentation, and cerebral sedatives, as the bromides and chloral, effect a speedy cure. In such cases, the question of the cessation of the spirits can not be for a moment doubtful. The effect being due to the impression of alcohol on the brain, no structural alterations having occurred, the obvious relief consists in the removal of the cause.

CHRONIC ALCOHOLISM.—From the brief view of the changes wrought in chronic alcoholism, before given, it is sufficiently evident that these changes may be comprehended in two groups, sclerosis and steatosis. In the brain and nervous system, as elsewhere, disorders develop, indicating the greater or less progress in these morbid processes. In the intellectual, motor, and sensory sphere are they alike exhibited. With the progress of the affection, the memory grows weaker, the judgment becomes less accurate, and the power of attention and of association of ideas greatly diminishes. Hence the puerilities of thought, the rambling and incoherence which are characteristic of the alcoholic. His moral sense is blunted; his duties to his family and to his business are neglected; he grows indifferent to his personal appearance, and becomes dirty in his habits. To remove the feelings of discomfort, which come on when the influence of the spirit declines, a constantly increasing quantity is necessary. He becomes dejected, morose, and irritable, and more and more stimulant is required to lift him up from his wretched moral state. The appetite declines, and is confined to a taste for condiments, for stimulating articles, and for those having a strong, even a biting flavor. The stomach becomes intolerant of food, and vomiting frequently occurs. Especially does the alcoholic suffer in the early morning before the morning dram gives steadiness to his nerves and tone to his stomach. There is, then, much straining and retching, only some glairy mucus and a little greenish matter coming up after great anguish. The mind becomes more and more impaired, the conversation is a maudlin rambling, and ultimately the mental condition declines into imbecility.

As regards the exterior of the body, chronic alcoholics exist in two types: the pallid, flabby, but fat; the red, even purplish-hued, and bloated—the former having a smooth, pallid, heavy, and imbecile expression; the latter, roughened by pimples and stigmata, dusky, with great bladders under the eyes, yellow and injected conjunctivæ, and lips blue and swollen. Before these external features are well marked, the symptoms produced by the anatomical alterations occurring in all parts of the body are developing. The chronic alcoholics experience disturbances in the functions of various organs. They have more or less headache, or a sense of weight and oppression in the head, ringing and drumming sounds in the ears, and attacks of dizziness or actual vertigo. Vision grows dull, objects float before the eyes, they

see flashes of light, and especially when about to fall asleep. Tremor now begins to be manifest, first probably in the lower extremities (Anstie), but soon occurring in both; at first under control, so that a strong effort can quiet the muscles, but presently becoming uncontrollable. The trembling is conspicuously worse in the morning before the drink and food have had time to support the waning power. Numbness, tingling, paresis of the muscles, occurring in one member, or on one side, and of brief duration, are not uncommon. Sudden attacks of vertigo, with instantaneous loss of voluntary control, the patient falling, with or without loss of consciousness, are sometimes experienced. With such attacks there may be twitchings of the muscles of the face or of a member, when, of course, the seizures wear an epileptic aspect. Hallucinations are experienced at this period at the moment of falling asleep or on awaking. When the alcoholic subject has attained to this degree of development of his disorder as manifest in these nervous symptoms, and in the state of his bodily nutrition as already described, he presents characteristic symptoms of disorders of digestion. The tongue may be heavily coated, or glazed and fissured. The breath is fetid from the presence of products of alcoholic decomposition. The appetite for ordinary food is almost lost, and much distress is experienced after eating, but especially in the early morning. Vomiting of blood is not infrequent. The stools are much altered in character, are often fetid, black and tar-like in consistence, and not seldom consist of blood. Hæmorrhoids form and often bleed freely, and sometimes *fistula in ano* occurs. In consequence of the obstructive changes in the liver, ultimately effusion takes place in the abdomen (ascites), and œdema in the lower extremities. When hæmorrhages occur from the intestinal mucous membrane, ascites is not so likely to develop. Sclerotic and steatose changes occur in the heart; the cavities are apt to dilate; calcareous deposits take place in the valves; the great vessels and the intra-cranial vessels undergo atheromatous degeneration, and cerebral hæmorrhage is one of the results which may be expected under these circumstances. Sclerosis and fatty changes may also occur in the kidney, and albuminuria result.

Chronic alcoholism tends to develop several distinct morbid states: an acute exacerbation called delirium tremens; acute alcoholic mania; acute alcoholic melancholia; dipsomania; acute alcoholic pneumonia. These require separate consideration, and with the fullness demanded by their relative importance.

DELIRIUM TREMENS.—Causes.—In the greatest number, delirium tremens is due to the action of the alcoholic fluid; it is an acute alcoholic delirium due to an unusual consumption of spirits by the subject of chronic alcoholism. In a smaller number, it is caused by the sudden withdrawal of the accustomed stimulus; the stomach is dis-

turbed, food and drink are rejected, and hence the nervous system is left unsupplied. An attack may also be induced by some strong moral emotion or excitement, or by an accident or injury.

Pathological Anatomy.—The anatomical alterations are those of chronic alcoholism. The brain has the appearance characterized by morbid anatomists as the "wet brain"—that is, there is much fluid in the subarachnoid space, in the ventricles, and at the base, and the veins and sinus are distended, the substance of the brain itself being more or less œdematous. In some instances there is active hyperæmia, the red points are more numerous, and vessels not seen in the normal condition become prominent. Meningitis, cerebral hæmorrhage, etc., may be present as complications. The most important complication is, however, pneumonia. The condition of hypostasis should not be confounded with hepatization. Renal changes are by no means infrequent.

Symptoms.—A continuous debauch may inaugurate the symptoms, or the stomach become very irritable, the appetite is lost and even the drink is rejected. The trembling characterizing the ordinary state increases; the manner grows excited and irritable, and the countenance, before dull and apathetic, now appears animated and restless. Insomnia is an early symptom; but snatches of sleep are obtained, or the night is passed in the vain effort to get a moment's repose. Then, the characteristic hallucinations and illusions come on. A patient of the author's, while apparently well, began to suffer from wakefulness, and, coming to him in the hurried and excited way characteristic of this state, said, with an air of mystery but of entire conviction, "It's most extraordinary," taking off his hat, "but the story of the garden of Eden is all dramatized on my hat," and he proceeded to point out with much eagerness each detail, until I startled him by declaring it an hallucination. Very often, for several days, such a patient will be about, under the influence of some illusion in regard to his own occupation, or to some public or private affairs, or of some extravagant delusion. Sometimes his notions are gay and pleasing, and he is all hilarity, but more frequently they are gloomy and frightful. The beginning of the delirium is usually at the moment of falling asleep, or in awaking, when the insomnia first occurs. He then sees frightful objects—goblins, demons, and monsters—but, fully awake, they vanish, and he is able to appreciate his real position. This preliminary state is often called "the horrors." With the progress of the case the hallucinations become constant. The condition is that of fright; the patient is menaced by persons, or demons, who take his life and he seeks to escape. As any one may assume this shape, such a patient may be dangerous, for, although the delirium is cowardly and he seeks to escape, he may, on a sudden, if he have a weapon, do some mischief, or he may cast himself from a window. He sees objects on

the wall, the figures of the paper appearing as snakes or devils, and they threaten and mock him. The figures on the coverlet appear as insects and snakes, and he tries to toss them off, or escape them. He peers furtively in the corners, and, rising up suddenly, looks under the bed. His eye rapidly glances about the apartment, and has a troubled and suspicious expression. He may be noisy and furious, yelling and screaming incoherently, fighting all who approach, and spitting out his food and drink. The quiet, cowardly and shrinking patients are usually controlled by firmness on the part of physician and attendants, but the more furious and maniacal may require the camisole. Besides the visual, there may be illusions of smell, the patient perceiving disgusting odors, and he may go about the apartment snuffing. Another has illusions of hearing, strange voices mocking or upbraiding or threatening him. In fact, the forms which his morbid fancies take are almost endless. The morbid activity increases the rate of circulation and excites sweating; but more or less fever comes on after a preliminary stage of depression. This stage of depression is characterized by a cold, clammy skin, a feeble pulse, and general muscular weakness. Fever then slowly develops; the temperature rises in some cases to 105° Fahr. (Magnan); the pulse becomes rapid, and is marked by an extreme dirotism. The tongue is moist and tremulous, sometimes coated heavily, more frequently is merely pasty. The stomach continues irritable, and food, if swallowed, is rejected; but usually difficulty is experienced in feeding these patients, and, when delusions of poisoning exist, feeding can be accomplished only by mechanical means. The bowels are apt to be confined. The stools are often dark and offensive, sometimes blackish and tar-like. The urine is scanty, very high colored, and may contain albumen.

Course, Duration, and Termination.—The course of delirium tremens is usually acute. Complications may arise to terminate the case in a few days, as a double pneumonia, a cerebral hæmorrhage, etc.; but the ordinary duration rarely exceeds two weeks, by which time recovery or death will have taken place. The first stage, as it may be called, from the beginning of wakefulness and hallucinations to the rise of fever, is very variable in duration, and may last for a week or ten days. Convalescence is inaugurated when sleep occurs and the patient awakes refreshed, and, taking food, retains it, and at the same time becomes clear in mind. Short snatches of sleep, the delusions continuing, and food still rejected, do not mark the beginning of convalescence. If the delirium subsides, but the patient still mutters and picks at the bedclothes, the tongue becoming dry and cracked, and regurgitation of dark, brownish and bilious matters taking place, the condition is a bad one, and an early fatal termination may be expected. Sometimes death occurs suddenly from failure of the heart; in the midst of active delirium the pulse becomes rapid and thready, the surface cold and

clammy, the features anxious and pinched, and death ensues in a few hours, or a few minutes even. Sometimes, after waking up from a state of forced sleep by narcotics, the patient passes into a condition of profound prostration which soon proves fatal.

Diagnosis.—The symptoms are so characteristic and the history so unequivocal, that an error is not likely to occur. Delirium tremens may, however, be confounded with its congeners, *acute mania* and *acute melancholia*, due to chronic alcoholism. The distinction rests on the characteristic trembling, the delirium of fear, and the peculiar hallucinations of delirium tremens, as well as its acuteness. The delirium which accompanies alcoholic pneumonia is like delirium tremens, but it arises during the pneumonia, whereas, when pneumonia complicates delirium tremens, it arises during the course of the latter.

Treatment.—There are two points to which attention must be directed: to provide suitable aliment; to procure sound sleep. As the stomach is very irritable, milk and lime-water may be given freely but at regular intervals. If the attack has occurred in consequence of the failure to retain the spirit, it is advisable to give a moderate amount of whisky or brandy with the lime-water and milk. In old drunkards it is not unfrequently the case that no aliment will be appropriated unless some spirit is given with it. When this condition exists it is indispensable to allow a moderate quantity of whisky or brandy. Sometimes an egg will be eaten, beaten up in beer or ale, but more frequently than any similar compound aliment will egg-nogg or egg-flip be readily taken and assimilated. Beef-juice may be given in alternation with milk, and, if the stimulant is necessary, can be added to it. When the attack of delirium tremens has succeeded to an unusual consumption of liquors, they should be discontinued, or given in much less amount. Here, also, may exist the same state of the digestive function, and the same impossibility of procuring assimilation without the accustomed stimulant. In fact, in this circumstance lies the solution of the problem. Can digestion and assimilation proceed without the stimulant? If so, it is unnecessary—for nothing has been more conclusively established than that the patient does well if he can take and appropriate sufficient aliment. The beef-juice or other animal broths given should be well fortified by red pepper, which serves a double purpose—to stimulate digestion and to act as a cerebral sedative. A bolus of capsicum, containing ʒss to ʒj, every four hours, is now known to possess distinct sedative and hypnotic properties, and has been successfully used in the treatment of the disease. The notion, formerly entertained, that to procure sleep by large doses of opium is the only objective point in the treatment of delirium tremens, has happily been abandoned, for under this system many patients were either fatally narcotized, or forced into a condition of *coma vigil* terminating in collapse. Forcing sleep is secondary to careful alimentation. The

best agent for securing sleep is chloral, or a combination of chloral and morphine; but chloral is not proper when the heart is weak, and opium or morphine when the tongue grows dry, and the delirium increases under its use. If, however, fifteen grains of chloral and one fourth of a grain of morphine secure sound and refreshing sleep for several hours, the patient awaking free from delusions, they have unquestionably done good. In the preliminary stage of "the horrors" sleep may be procured by full doses of bromide of potassium. Cardiac paralysis has ensued in several cases of delirium tremens, after the administration of chloral and bromide of potassium, and fatal narcosis by the combination of chloral and morphine. Pilocarpine has proved to be exceedingly effective in causing sleep and quieting delirium. When there is a decided tendency to cardiac failure, and at the same time active or furious delirium, tincture of digitalis in drachm-doses, or more, is unquestionably very beneficial. Where opium is not well borne, or contraindications to it are present, tincture of cannabis indica may be used with advantage. The internal use of chloroform has acted well in some cases in procuring sleep; but the inhalation of chloroform is very hazardous, and has proved fatal. Besides the dietetic and medicinal treatment, certain moral considerations must have due weight. The subject of delirium tremens should be in charge of a resolute and patient nurse. The apartment should be as remote as possible from the noises of the outside world. The walls should be of a neutral tint, without figures, and the bed-hangings, curtains, etc., should be perfectly plain and of some subdued color. All objects in the room not necessary to the care of the patient should be removed; as little as possible should his attention be attracted by coming and going, and all appearance of mystery, such as whispering, the exchange of signals, etc., should be avoided.

Acute Alcoholic Mania is an outbreak of acute mania due to alcoholic excess, and to the changes induced by such excess in the condition of the intra-cranial organs. The predisposition is inherited. The special point in such cases is the tendency to the commission of homicidal acts.

Acute Alcoholic Melancholia, like acute mania from the same cause, is induced by drink in a subject having an inherited tendency. The symptoms present the usual type, and the special characteristic is the desire of self-destruction.

Dipsomania, as the name imports, is that mental condition which impels to the drinking of intoxicating liquors. This form of mental disorder is the sad inheritance from drunken parents. At the earliest period after taste has become differentiated, these unfortunates display a strong and special inclination for liquor, and for its exhilarating effect, and by the time puberty is reached they are already drunkards. In some cases this mental disease manifests itself in periodical attacks,

characterized by a ferocious and utterly uncontrollable impulse to indulge to excess in strong drink. These periodical attacks are at first separated by considerable intervals, and, beginning at puberty, may not seriously impair the tone of the mind and the power of self-control until thirty-five, but from this period on the intervals become very narrow, and the entire surrender to alcoholic excess follows at no distant time.

Acute Alcoholic Pneumonia.—The most frequent and fatal complication of delirium tremens is pneumonia; but the latter is very frequently mistaken for the former. In old alcoholics, an attack of croupous pneumonia approaches insidiously, and the first symptom indicating illness may be the peculiar hallucinations and illusions. Very often the hallucinations refer to the difficulty of breathing, the patient maintaining that the air is stuffed with something, or that something interferes with its entrance to his chest. The delirium under these circumstances is comparable to that which comes on in the inebriate after an injury or a surgical operation. The pneumonia not being recognized, the case appears to be one of delirium tremens. The radical distinction between the two affections is this: In acute alcoholic pneumonia, the pulmonary disease precedes the delirium tremens and is the cause of it; in delirium tremens, pneumonia is a frequent complication. In the treatment of acute alcoholic pneumonia, the habit of the system should not be broken off, but stimulants should be allowed, and they may be pushed freely.

Sequelæ of Chronic Alcoholism.—Besides the morbid states which may develop during the course of chronic alcoholism, there are sequelæ which require some consideration. We owe particularly to Magnan* the development of our knowledge on this point. It is not difficult to comprehend the relation of the various anatomical alterations produced by alcohol, and such consecutive maladies as ascites, dementia, general paralysis, and the mental disturbance produced by hæmatoma of the dura mater. Ascites, dementia paralytica, and hæmatoma, have been studied elsewhere, and the mental enfeeblement produced by atheroma of the cerebral vessels has been mentioned in connection with that topic. It is merely necessary here to name these sequelæ, and to invite the attention of the reader to their independent treatment under their appropriate heads.

Treatment of Chronic Alcoholism.—For the disorders of digestion, morning vomiting, and loss of appetite, accompanied by wakefulness and nervousness, the appropriate remedies are abstinence, careful alimentation, the administration of such tonics as quinine, tincture of nuxvomica, oxide of zinc, etc., and the use of bromide of potassium to procure quiet sleep. In the more chronic cases, where degenerative changes may be expected to have taken place, arsenic in small doses

* "On Alcoholism," etc., London, H. K. Lewis & Co., 1876.