

through the lymph vessels of the liver. Contrary to the view of Bouchard, it is now generally believed that the bile pigments are comparatively harmless and that the bile salts are the more actively toxic agents.

The group of severe nervous symptoms seen in grave disease of the liver and known as cholemia depend, in all probability, however, not upon a poisoning by bile salts from hypercholia, but rather upon the serious metabolic changes caused by cessation of the bile-forming function, and probably at the same time cessation of the other functions.

That part of the urea formation of the body which takes place in the liver (the so-called "Schroeder's portion") is formed from ammonium carbamide, which is a destructive product of the albumins and the amido acids. In severe disease of the liver this "Schroeder's portion" of urea is usually lacking, and the unused ammonium carbamide is in part changed to ammonium carbonate.

The introduction of ammonium carbamide into the blood of an animal produces symptoms very closely corresponding to those which follow total extirpation of the liver.

The liver seems to prevent the entrance into the systemic blood of these toxic substances which are intermediate steps between albumin and urea, *i. e.*, leucin, glycocoll, the amido acids, and especially ammonium carbamide.

Insufficiency of the liver function, then, always favors the development of auto-intoxications from the gastrointestinal tract.

**Acute Yellow Atrophy. Cholemia.**—The ultimate cause of acute yellow atrophy, except in cases of phosphorus poisoning, is still entirely unknown. Whatever it may be, there can be little doubt that the symptoms depend upon the failure of the liver to exercise its functions in converting or rejecting the many toxic products of digestion carried to it by the portal vein. We therefore have a typical example of auto-intoxication occasioned by the failure of function in a particular, and in this case a most vital, organ of defence. As a result of the failure of liver functions, the blood is flooded with substances which normally are not found there. Among these, leucin and tyrosin are the best known. It is probably no single substance, but the sum of all the foreign substances circulating in the blood, which gives to the disease its clinical picture.

The appearance in the urine of leucin, tyrosin, and other foreign bodies, and the great diminution in the excretion of urea, are exactly what might be expected from cessation of liver activity. The irritation of the kidneys by these foreign bodies may well render their excretion less complete, and so complicate still further the situation. Moreover, since urea is an active diuretic, its great decrease may have the effect of still further impairing renal activity.

**Diabetes.**—Not the least important function of the liver is to arrest the sugar carried to it and to convert this into glycogen. The liver is not a perfect filter, however, and even under normal conditions a small quantity of sugar gets past the barriers and so reaches the blood. When sugar is formed in the intestine in amounts greater than normal, more of it is apt to escape the liver filter, and when this sugar in the blood reaches a certain amount it makes its appearance in the urine and thus is produced an "alimentary" glycosuria. Sugar in the blood possesses marked toxic properties, and seems especially to be a "protoplasm poison," leading in all severe forms of diabetes to vastly increased tissue destruction, to excessive albuminous metabolism, and to high nitrogen excretion. Whatever its cause, therefore, diabetes is still a typical example of an auto-intoxication.

Since destruction or extirpation of the pancreas is so regularly associated with severe diabetes, it is evident that the pancreas must have for one of its functions the regulation of normal metabolism much as has the thyroid gland.

With the failure of this sugar-controlling function of the pancreas the liver is quite unable to arrest all of the

excess sugar carried to it, and the filter becomes altogether inadequate. The nature of this regulating function is entirely unknown. It may possibly depend upon a ferment.

**Addison's Disease.**—The modern theory, which regards Addison's disease as an auto-intoxication caused by failure of the specific function of the adrenals, while still lacking in direct proofs, has yet some interesting facts to support it and is gaining general acceptance. This view holds that the adrenals exercise some control upon the processes of metabolism whereby the action of certain toxic substances is neutralized or the bodies are converted into harmless ones. Just as the thyroid seems to have a regulating effect upon the mucin formation of the body and the pancreas upon sugar formation, so the adrenals have a specific influence upon the conversion of one of the most widely distributed nitrogenous, organic substances in the body, namely neurin.

**AUTO-INTOXICATIONS OF THYROID ORIGIN.**—The recognition of the relation between myxœdema and cretinism and the atrophy or destruction of the thyroid gland; the discovery that total extirpation of the thyroid was regularly followed by those cretinoid manifestations known as cachexia strumipriva, and the results of the treatment of myxœdematous conditions by thyroid extract, have served to throw much light upon the hitherto little understood functions of this ductless gland. It can now scarcely be doubted that the thyroid exerts some form of controlling action upon the products of digestion whereby complete assimilation is brought about. It completes the conversion of the absorbed foods and destroys certain unfinished toxic products of metabolism, in particular the mucin. The exact method of its action is not clear. It may be that by its cell activity the thyroid transforms into harmless bodies certain toxic ones brought to it by the blood, or that it generates a particular product which upon entering the circulation neutralizes the effects of certain poisons. It is possible that it may combine both of these functions. In any case, cretinism, myxœdema, and cachexia strumipriva must be regarded as auto-intoxications due to failure of function of a particular organ of defence.

In *exophthalmic goitre* we have a clinical picture which in many respects is the direct antithesis of that of myxœdema; furthermore, as Greenfield has suggested, the histological appearances are those of an organ in active evolution; finally, the poisonous symptoms produced by too large doses of thyroid extract bear a striking similarity to those of exophthalmic goitre.

These facts have naturally led many to the belief that Graves' disease is the result of a morbid activity of the thyroid gland; and although there are some contradictory facts still to be explained, this theory is the one now very generally accepted. Regarding the nature of the auto-intoxication, two views are held: one, that by some anomaly of function an abnormal and toxic secretion is formed; the other, that the symptoms depend upon the production of the normal secretion *in excessive amount*. The latter view seems at present to be the more plausible one.

It must be added that another hypothesis which has recently gained some adherents attributes the condition to an auto-intoxication of gastro-intestinal origin. One experimental fact seems to offer support to this view. Hürthle has found that by inducing jaundice through ligation of the gall duct in animals, a change in the activity of the thyroid was regularly produced whereby an excessive development of colloid resulted.

**THE AUTO-INTOXICATIONS OF PREGNANCY.**—The hypothesis which sees in many of the disorders of pregnancy the manifestations of a poisoning of the organism by the products of its own metabolic processes has much that is attractive and plausible in it, and in the case of certain affections, especially in that of eclampsia, can summon to its support a considerable number of very significant facts.

It has been clearly shown that during normal pregnancy an increased amount of work is put upon the

various organs of the body, and especially upon those concerned in the processes of metabolism and elimination.

The increased demand upon the organs can under perfectly normal conditions be met satisfactorily, and we see women go through their period of gestation with scarcely a single departure from the state of perfect health. These increased demands, however, are prone to bring to light any inherent weakness in an organ which in the non-pregnant state may perhaps be capable of performing its functions most satisfactorily.

Among the organs of defence which are likely in pregnancy to manifest evidences of insufficiency, the liver and kidneys stand alone in point of importance. The liver in particular seems especially liable to fail in the performance of some of its manifold functions.

In the symptoms which, with greater or less reason, have been ascribed to auto-intoxications, are included the obstinate vomiting, salivation, insomnia, peripheral neuritis, the psychoses of pregnancy, bronzing of the skin, pruritus, jaundice, eclampsia, and acute yellow atrophy. In connection with salivation it is interesting to recall that one of the poisons found by Bouchard in normal urine was a powerful sialogogue.

**Eclampsia Gravidarum.**—The urine of eclamptic patients has been found to be much less toxic than that of other pregnant women, while the blood serum, on the other hand, is distinctly more poisonous than that in normal pregnancy. There can be no doubt, therefore, that in the blood of eclamptic patients there is an accumulation of poisonous substances. These in all probability are not the end products of destructive metabolism, but rather the intermediate products which have gained the circulation because of failure on the part of some organ to convert them into useful, or at least harmless, bodies. In other words, eclampsia presents every evidence of being a severe auto-intoxication.

While certain cases of eclampsia may be identical in nature with uræmia, there is much evidence to show that in many, and perhaps in most cases, the two conditions are quite distinct.

Within the past few years many investigators have called attention to the association of severe hepatic lesions with the manifestations of eclampsia, and it cannot be doubted that some at least of the severe anomalies of metabolism found in this condition are due to derangement of the liver functions. In some cases the liver has shown post mortem the typical appearances of acute yellow atrophy; in others those of hemorrhagic hepatitis; in others still, many necrotic areas have been found. Schmorl reports a series of seventeen cases, in every one of which serious changes in the liver parenchyma were found post mortem. These consisted usually in necrotic areas of hemorrhagic or anemic character. Macroscopically the livers presented somewhat the appearance of acute yellow atrophy.

Stumpf suggests that the liver disturbances are of secondary nature, and that the origin of the poison may lie in the fetal organism. Under the influence of this unknown poison there is, he believes, an interference with the formation of urea. As a result of this, abnormal products of metabolism reach the blood and furnish a source of irritation to the kidneys, which, in turn, become insufficient and fail properly to eliminate these noxious bodies. The resulting abnormal condition of the blood acts also as a poison to the liver cells, and the failure of function of these precipitates the eclamptic attack through action upon the central nervous system.

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In an article such as the present one it is impracticable to give specific references for all the many assertions made therein. While numerous sources of information have been utilized, most of the statements contained are based upon those found in the following publications:  
Bouchard: Lectures on Auto-Intoxication in Disease. English edition, 1894. F. A. Davis Co., Philadelphia.  
Albu: Ueber die Autointoxicationen des Intestinaltractus, 1895. Hirschwald, Berlin.  
Vaughan and Novy: Ptomains and Leucomains. Third edition, 1896. Lea Bros. & Co., Philadelphia.

G. Bouffe de Saint-Blaise: Les auto-intoxications de la grossesse, 1899. Baillière et Fils, Paris.  
Bickel: Die Pathogenese der Cholemie, 1900. Bergmann, Wiesbaden.  
Of these, the work of Albu has proved especially valuable, and to it those readers who desire more detailed information are referred.

**AUTOMATIC ACTIONS.**—By the term automatic actions, as applied to living bodies, we mean those movements which go on without any outside stimulus, the causes being in the body itself. For the sake of understanding them more clearly it is necessary to divide them into certain classes, which, so far as the higher animals are concerned, are as follows:

1. **THE AUTOMATIC ACTIONS OF VEGETATIVE LIFE.**—Under this head we have: (a) those of the respiratory neuro-mechanism; (b) those of the cardiac neuro-mechanism; (c) those of the vaso-motor neuro-mechanism; (d) the rhythmical movements of the stomach, intestines, spleen, and bladder.

The automatic actions in these classes may be modified by voluntary or other extrinsic influences, but they are, nevertheless, essentially independent of them. Thus the respiratory movements may be modified by volitional impulses, but they in the main go on rhythmically and independently. The mechanism of this process of automatism is well illustrated in the cardiac movements. The pulsations of the heart depend upon the stimuli rhythmically sent out by the intrinsic ganglia. The cells which originate these stimuli receive no excitation themselves except that furnished by the aliment from the blood. This aliment is constantly building up these motor cells into a more and more unstable condition. When the instability reaches a certain limit, the cell decomposes or explodes with a discharge of its force, after which it immediately begins to build up into instability again; and so the process goes on. This explanation applies to all the rhythmical automatic movements of vegetative life. The movements are performed by unstriped muscles, or the muscles of internal relation.

2. **THE AUTOMATIC ACTIONS OF VOLUNTARY LIFE.**—A second and much more striking class of automatic activities includes those involving voluntary muscles and the mind. They appear in various forms and in varying complexity according to the part of the nervous system which they involve. They may be divided as follows:

(a) **The Motor Automatism.**—The harmonious movements of the eyes, the muscular adjustments called forth in the use of the voice, and of the jaws, mouth, and throat in suckling, are illustrations of motor automatism. The movements of the body and limbs in standing, sitting, walking, and in the various acquired dexterities, such as those of dancers, players, jugglers, acrobats, and skilled artisans, all are done automatically. Being, in man, acquired by practice, they may be spoken of as secondary automatic actions. They have for their anatomical substratum certain arrangements of nerve fibres and cells in the cerebellum, basal ganglia, and spinal cord. The conscious mind, though taking no active share, first fathered them, and stands in ready connection with them. It starts or stops the machinery, just as by touching the pendulum we start or stop a clock that has been wound. Physiology teaches also that all voluntary acts tend by repetition to become automatic. For voluntary movements, by repetition, are more and more easily and quickly performed, until at last they no longer possess the elements, such as duration and intensity, necessary to arouse consciousness, and they are then done automatically.

(b) **Psychical Automatism.**—There is another class of automatic activities closely related with the foregoing. Here volition and normal consciousness have no share at all, and the whole psychical life, so far as it appears at all, is automatic. The mind becomes a real machine, working in certain established grooves, unmodified by any volition or by any external or internal stimulus except such as gives it the start; just as the boy trims the sails and fastens the rudder of his toy boat, then launches it to sail as its mechanism directs.

This psychical automatism is represented in lower ani-

mals by many of their instinctive acts. In following its instincts the animal obeys no conscious purpose, but is impelled by unfelt stimuli from within, these stimuli being furnished by the peculiar anatomical arrangements and nutritive needs of its nervous system, inherited from its ancestors. Instinct covers in the lower animals, however, both the acquired aptitudes and the psychical automatisms in man.

This psychical or cerebral automatism is perfectly illustrated in the conditions known as trance and somnambulism. Here consciousness, while not exactly abolished, is in an aberrant state (see *Consciousness, Disorders of*), the will is suspended, but thought and feeling continue, and the body responds in systematized and apparently intelligent acts.

There are two distinctions which in a medical study of psychical automatism must be made: First, unconscious cerebration is a different thing from the psychical automatism which we are describing. The term unconscious cerebration should be limited to that very large share of our mental life which runs on beneath consciousness. Few persons, in carrying on a train of thought, bring every link in the logical chain into consciousness. We pass with a step from the first term to the last, the intermediate process being subconscious. In the association of ideas, one mental picture is often followed by another apparently remote, the missing links not rising into conscious view. Unconscious cerebration, therefore, refers simply to the subconscious part of our ordinary thoughts and feelings, and is one of the modes in which the mind naturally acts. Second, cerebral automatism, as understood by some writers, such as Carpenter and Luys, is made to include cerebral reflex acts, *i. e.*, all the mental acts which arise involuntarily in response to a stimulus. Thus we are told that the ready response of emotion at a dramatic climax, the instant formation of judgment where certain simple and common conditions are present, are all examples of cerebral automatism. From this same point of view, the common sense of mankind is but the automatically formed judgment upon the various affairs of life, which rises alike in the great mass of men. There is propriety in this view, and lines of distinction must be somewhat arbitrarily drawn. Nevertheless, the acts referred to are much more typically reflex than automatic acts, as, for example, when a novel situation excites at once spontaneously a burst of laughter. And it is better to limit the term cerebral automatism to those conditions of the mind in which spontaneity is abolished for a time and the psychical mechanism acts entirely apart from any conscious stimulus.

Cerebral automatism, as thus limited, is pathological and has a medical importance. It is a condition that is brought about by a number of causes, and makes a somewhat different clinical picture accordingly. Cerebral automatic states may be classified as follows: The epileptic, the somnambulant, the hypnotic, the automatism of inebriety, of insanity, of narcotic intoxication, of syphilis, of injuries to the head, and of overwork or cerebral exhaustion.

**EPILEPTIC CEREBRAL AUTOMATISM.**—The automatic mental state which occurs in epilepsy accompanies much more frequently *petit mal* than *grand mal*. It generally follows the attack, but sometimes precedes it, and still more rarely takes its place, in which latter case the terms psychical epilepsy (Hughlings Jackson), masked epilepsy (Esquirol), *epilepsia larvata* (Morel) have been applied. It is a transitory psychical disturbance, and only one of several forms which occur at this period (see *Epilepsy*). Cases of epileptic automatism are numerous. In the simpler forms, the patient simply proceeds to do some ordinary but inapposite act. Often he begins suddenly to undress, or tries to go upstairs, and will climb upon a chair, or table, or shelf. Very frequently he puts some object near at hand in his pocket. Much more complicated acts may be done. A patient of Le Grand du Saule's, after an attack, found that he had taken passage in a steamer for Bombay. Gowers tells of a carman who, after an attack, drove for an hour through the crowded

streets without accident. Trousseau relates the case of an architect who, when seized with an attack, would run quickly from plank to plank without falling; and Gowers, again, had a young lady patient who, during the epileptic automatism, would play the most difficult music. In some cases the emotional faculties are more involved, and attacks of transitory mania, or furious impulse, occur.

**ARTIFICIAL CEREBRAL AUTOMATISM, HYPNOTISM, TRANCE.**—In the condition known as hypnotism, trance, mesmerism, "electro-biology," the phenomena of cerebral automatism are very perfectly shown, and an understanding of it gives the key to all the cerebral automatic states. When the hypnotic condition is produced artificially in a man he is instructed first to fix his attention upon some particular object, such as a bit of glass, which is held slightly above the level of vision, so as to put the ocular muscles upon a certain strain. After a few minutes, in sensitive subjects, the nervous force seems to lose its equilibrium and to concentrate itself in one particular direction. Little force is left to supply the rest of the conscious functions of the brain, and the whole mental life of the subject is narrowed into one field. The mind is but a point. The equilibrium of nervous force being once overturned, it continues unstable, and can be turned in one direction or another, according to the suggestion of the manipulator. Thus the hypnotic thinks that he sees a beatific vision, and every capacity of his mental being is expended on the feelings that such a vision excites. Or he is told that he is a murderer, and must die, and he is overpowered with fear and remorse. Or his mind is directed to the idea that one side of his body is insensible; he then feels no pain on that side. In any case, his mental energies are all so absorbed by some single dominant feeling, that ordinary sensory impulses coming up to the brain impinge fruitlessly upon consciousness, and awaken no sensations. The hypnotic is to all intents and purposes anaesthetic, blind and deaf to everything except an expected suggestion from the operator, which is the only link that holds him at the time to the external world. Under the domination of some particular idea or feeling, his mind may automatically cause him to perform many complex and apparently intelligent acts. The concentration of nervous force upon some particular function, such as that of sight, hearing, or touch, exalts these senses, so that vision is clearer, hearing more acute, and the touch more sensitive (see *Hypnotism, Somnambulism*). Such is, in brief, the physiology of hypnotic automatism.

Although the hypnotic condition is usually produced artificially, certain persons of a highly sensitive, nervous temperament are subject to spontaneous attacks, just as other persons suffer from the similar condition of somnambulism. Indeed, spontaneous hypnotic attacks are a kind of day somnambulism. Individuals thus suffering are generally of a hysterical temperament, with deficient will power, and their hypnotic attacks may accompany, or be complicated with, attacks of catalepsy, ecstasy, or hysterical seizures of various kinds. There are persons who have a congenital tendency to fall spontaneously into hypnotic states. Such was the case with a patient of Le Grand du Saule's, who, whenever he got into a state of excitement or expectancy, would fall off into a hypnotic sleep. Some of the reported cases of morbid somnolence belong to this class (see *Sleep, Disorders of*). In other instances the tendency to spontaneous trance states is acquired, as in a case reported by Finkelnburg: a young woman, having been once mesmerized by a professional, ever after was subject to spontaneous attacks of trance.

The condition of trance, or one closely allied to it, is induced voluntarily by the so-called trance speakers. It may also be brought on by some periodically recurring affection, as was shown in a case related by Dr. B. F. Berkley (*Western Journal of Medicine and Surgery*, N. S., vi., p. 204). A married woman, aged thirty-nine, for years suffered from trigeminal neuralgia, which finally ended in a severe form of tic douloureux occurring every

two weeks. After each attack she fell into a state of "somniaquance" lasting for an hour or two. During this time she would preach on religious topics with some amount of eloquence. She was a modern illustration of the similar states into which the priests of the Delphic oracle went when uttering their prophecies.

Hypnotic states are generally brought to an end by the passes of the manipulator. If the patient is left alone the hypnotic state continues for some hours, passing finally into true sleep, from which he awakens spontaneously. In some persons who are subject or have been subjected to periodical attacks of hypnotism, the mind recalls in one attack what occurred in the previous one. After such a person comes out from an attack he has no recollection, as a rule, of what was done in it. There are considerable variations in the degree or intensity of the hypnotic state. In the slightest degrees it resembles considerably that of profound reverie or abstraction. There is a distinction, however, between the absorbed reverie of the student and the absorbed contemplation of the hypnotic. In the former case the mind is constructing and building under a certain kind of voluntary direction; in the latter the mind is going automatically over old ground.

**TRAUMATIC CEREBRAL AUTOMATISM.**—Very rarely injuries of the head produce such a pathological change in the brain as to make the person injured the subject of periodical attacks of cerebral automatism. In these cases the mental condition is the same as if the patient walked in his sleep or had been artificially hypnotized.

One of the most typical cases of this kind is that related by Mesnet, of the French soldier who, after suffering from a severe injury of the head, used to pass into automatic states lasting for days. He would then unconsciously go through all the routine actions to which he had been accustomed, such as dressing, taking a walk, smoking, etc.

**THE CEREBRAL AUTOMATISM OF INEBRIETY.**—Dr. T. D. Crothers has related some remarkable cases in which the effect of the long-continued abuse of alcohol has been to induce periodic attacks of cerebral automatism. The patients fall into a state very much resembling that of hypnotism. In this condition they may go through the ordinary routine of life in so perfect a manner that no one would recognize the peculiar aberration of the mind. After a period of hours, or even of a day or more, normal consciousness returns and they remember nothing of what they have been doing. One of the most remarkable illustrations of this kind was that of a railway conductor who, after passing into the automatic state, would take charge of his car, run the train, collect tickets, make change, and do all the other duties of his position. Finally, after returning home and awaking, he could remember nothing of what he had done.

Briefer and less typical attacks of cerebral automatism occur undoubtedly in very many cases of chronic inebriety.

**SYPHILITIC CEREBRAL AUTOMATISM.**—Cerebral syphilis sometimes produces states of automatic mental action, though these are not of a very typical kind. The syphilitic poison causes a kind of somnolent or stuporous condition, in which the patient appears incapable of voluntary intelligent acts. When roused and set upon ordinary tasks or routine duties, he goes through them automatically and almost unconsciously.

**THE AUTOMATISM OF BRAIN EXHAUSTION AND BRAIN DISEASE.**—Luys ("The Functions of the Brain," p. 183) relates the history of a young man who had been for several days engaged in making calculations of compound interest, which had caused a great tension of his mind. One evening, after dinner, he was about to go to sleep when, as he says: "Without the slightest encouragement on my part, in a state between sleeping and waking, I began, without the smallest volition on my part, to calculate and go over again exactly the same problems as when in my office. The cerebral machine had been set in motion too violently to be stopped, and this involuntary work went on in spite of me, and in spite of all the means

I endeavored to employ to cause its cessation, that is to say, for from about three-quarters of an hour to an hour and a quarter." Many persons, after an evening of exhausting study, on retiring to bed have experiences somewhat similar to the above. Healthy persons also discover a little of this cerebral inertia in their disinclination, or even absolute inability, voluntarily to leave a task in which they are absorbed.

Dr. O. C. Gibbs (*Pennsylvania and Independent Medical Journal*, ii., p. 12, 1859) relates the history of a large, muscular man, aged fifty-five, who showed, in a permanent and exaggerated form, this kind of automatic condition. The person in question had been a hard drinker and smoker, but had suffered from no disease. His family at last noticed, however, that his mind was somewhat affected. His memory failed, and he would tell the most absurd stories. Gradually his intelligence diminished and his will became impaired. When he began to do a certain thing he had no power to stop himself. If he went to the barn to throw down hay he would never stop, unless interfered with, until he had pitched off the whole mow. If sent out to bring in an armful of wood he would never stop until the pile was all in, or the room was full. When he once commenced to eat, it seemed as if he could never cease. As his mind became more affected he gradually lost the power of balancing himself, and showed a constant tendency to go backward when standing, and to tip over backward when sitting. He slept much. His strength gradually failed, and he died with no marked symptoms. The diagnosis of cerebral softening was probably correct, although no post-mortem examination was made.

**THE CEREBRAL AUTOMATISM OF INSANITY.**—The condition of cerebral automatism has been described as a form of insanity. But, on the other hand, there are forms of insanity in which cerebral automatism appears as part of the phenomena of the disease. Thus, maniacal states, especially those of epilepsy, and the impulsive acts in the various states of defective mental inhibition, may be looked upon as automatic.

Perhaps the automatic cerebral life in the insane is best shown in acute dementia, in which disease only the lowest of the mental functions remain, and the sufferer is guided only by the impulses and stimuli of his vegetative system.

In secondary dementia, and in idiocy and other states of mental enfeeblement, the mental activities, so much as remain, are more or less automatic.

**MEDICO-LEGAL RELATIONS OF CEREBRAL AUTOMATISM.**—In conclusion, I have only space to call attention to the very evident medico-legal importance of a knowledge of cerebral automatic states. This applies especially to the more frequently occurring forms, such as those of artificial, epileptic, and possibly inebriate, automatism. There is no doubt that a cerebral automatic is irresponsible, morally, for his acts, and except in inebriate automatism, the courts would sustain the medical view. Unfortunately, it is as yet practically almost impossible to demonstrate by objective tests that an accused person was really in an automatic state.

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**AUTOPSIES.**—(Synonyms: Post-Mortem Examination; necropsy; Latin, *Autopsia cadaverica*, *sectio*, *obductio*; French, *nécropsie*, *autopsie cadavérique*; German, *Leichenschau*, *Sektion*, *Obductio*.) An examination of the body after death, to investigate the condition of the various parts of the body, to note any changes in the organs, and to determine as far as possible the cause of any such changes.

**GENERAL CONSIDERATIONS.**—An article intended, as this is, to aid the general practitioner in making a post-mortem examination would fall short of the mark were it to give simply the various cuts to be made in order to expose and permit of the examination of the different organs. While it would be out of the question, in a handbook, to detail all the possible alterations in the viscera, and the method of their recognition, yet there