

3. Describe the medulla, its nerves and reflex action; its respiratory center; its vasomotor center; and the effects of its injury.
4. Describe the cerebellum and give its action.
5. Describe the optic tubercles and give their action.
6. Describe the cerebrum; its hemispheres, fissures, convolutions, gray and white matter, and regions.
7. Locate the region in which impressions of sight are received; of touch; of hearing; of smell; and of taste.
8. Describe the region from which motor impulses for voluntary motion are sent out.
9. Describe the memory, and show why recalling one thought brings to mind another thought of the same object.
10. Locate the thought region of the brain, and describe the process of thought.
11. Show that by speech man gains ideas which an animal can get only by actual experience.
12. Locate and describe the mode of action of the center for spoken words; for written speech; and of the speech-hearing and speech-seeing centers.
13. Describe the three main divisions of the acts of the mind.
14. Compare the corresponding parts of the brains of different animals with each other and with the same parts of the brain of man.
15. Describe the nervous system in insects, worms, shellfish, and in the lowest forms of animals.

p 305 - 314

CHAPTER XXXII

INFLUENCES WHICH AFFECT THE MIND

550. Stimulation to action. — The thought cells of the brain are given power over voluntary actions of the body, with no higher power to cause them to act, except the will, which is the result of their own action. Were a child left entirely to itself, it would probably exercise its mind no more than an animal. But the sight of objects and ambitions not yet attained spurs the thought cells to action, just as sensations cause the spinal cord and motor region to act. Without constant stimulus of the senses and feelings the thought cells languish and almost cease to act. As the body is compelled to grow by the cells of the spinal cord, so must the mind be compelled to grow by an effort of the will. Few men possess a will strong enough to act without the stimulus of other minds, but association with trained minds arouses the will to exercise one's own mind.

551. Concentration of the mind. — In order to become educated, the mind must be exercised persistently and for hours at a time. The mind does not grow unless its whole energies are often directed towards a single object. It is not study to read a page and then to converse about sports for a moment and then to study another moment, for each impression sweeps away the preceding one. True study is to sit down in a quiet room, and to fix the mind upon the book continuously for an hour or more. Then the mind will be occupied so that it takes no note of time or outside

impressions. Any one will find study interesting if he will concentrate his mind upon a subject so that he gains knowledge. Then when playtime comes he will enter into the sport with zest and satisfaction. No one who has not been working can truly enjoy play.

552. Persistence of mental impressions. — Brain work requires heat and energy like muscular work. The cells of the cerebrum retain an impression of each thought, which is deep and permanent in proportion to the power expended upon it. A lesson learned in a minute makes some impression upon the cells, but it is gone in another moment. A dull boy hammers away at a lesson by the hour, but at the end of a year he will have retained far more than the brilliant boy who loses his impressions as fast as he gains them.

It is extremely difficult to efface impressions once really made upon the cerebral cells. Apparently, knowledge may be forgotten, but some day something will cause the cells to recall the impressions. Thus it is very important to avoid all thoughts which we should be ashamed to recall.

553. Habit. — Memories of thoughts often repeated may arise in spite of the will to restrain them, and may compel the motor region to do acts which the will utterly abhors. At first a man's will has to direct the thoughts to speak profane words. Soon the words become so imprinted in thought that they arise even without his knowledge. Habits grow faster and stronger than the will to overcome them. On the other hand, one can form a habit of study and of mind cultivation so that mental work is a pleasure. The more one works with his mind, the more he enjoys his work. The mind is constantly forming habits of thought. Even if it thinks nothing bad, yet it may soon acquire a lazy habit of not thinking at all.

554. Heredity. — Impressions of any kind may become so permanent that one's children have a tendency to

acquire them. The son of a criminal has a natural tendency to become a criminal, and even if he is well brought up in an upright family he will be far more likely to yield to temptation than a well-born child. Children of educated parents take naturally to study. Children of excitable and nervous parents will also inherit their disposition. By education, natural tendencies of mind and character can be overcome. If a wrong tendency is known and is not corrected, the blame for future action of the child will lie with his educators rather than with the man.

555. Unconscious mind action. — When the mind is intensely occupied it may not take note of severe sensory impressions. Thus soldiers in battle often fight on, unconscious of severe wounds. You may try in vain to recall a name. Later, when you are thinking of something else, the name may flash into your mind. You may strive to direct the mind to a lesson, but thoughts of a sick friend may persist in arising, and may shut out all thoughts connected with the study. In acquiring any new thought the mind must reason by conscious efforts, step by step, until the idea is clearly in view. Ever afterward the mind may reason out the steps unconsciously and almost instantly, so that we may lose sight of the complexity of the mental processes involved in forming the idea. Learning to perform any mental process is essentially becoming able to do it with little or no conscious effort. Then the mind, relieved of the conscious direction of thoughts already learned, is free to acquire new ones. Man is probably unconscious of most of the steps in his mental processes.

556. Sleep. — It is as impossible for the mind to put forth conscious effort continually as it is for the muscles. A rest from conscious effort is called *sleep*. As a rule, a man needs about seven or eight hours of good sleep; a boy of sixteen needs nine or ten hours, while one of six needs twelve. Sleep should be regular, so that the brain may not become excessively tired between times. As a general rule, an early hour both for going to bed and

for rising is desirable. If a student would go to bed when he feels sleepy, and would sleep an hour or two longer each night, he would feel able to do more and better work during his working hours.

557. Sleeplessness. — Like other organs while resting, the brain contains but a small quantity of blood during sleep. If a large amount of blood continues to flow through it, sleep will be impossible. Often when a person cannot sleep he can feel the pulse in his temples throb and hear it as his head lies upon the pillow.

A common cause of sleeplessness is an empty stomach. A light lunch will often cause the arteries of the abdomen to dilate and take up the blood which circulates in the brain and so relieve the cause of sleeplessness.

Lack of work during the day may be a cause of sleeplessness. Many a man finds himself suddenly unable to sleep when he retires from active business. It seems to be a law of nature that he who does not work cannot sleep, for he is not tired enough to need a rest. Occupation for the mind and body will give such persons a good night's sleep.

Worry will also cause sleeplessness, for it keeps the cells of the brain in action just sufficiently to attract the blood to the head. The brain can endure extremely hard work if it only gets rest between times.

Narcotics, like opium and chloral, will always produce sleep if taken in sufficient doses. But they injure the cells to a greater degree than they do good. In times of anxiety the temptation to resort to them is great, but their use at such times invariably leads to a habit of using them, with all its accompanying evils and dangers.

558. Dreams. — Sometimes during sleep the sensory and motor regions recall their memories with the vividness of real life. This is a *dream*. The thought regions rarely take part in a dream. Disordered memories of the sensory and motor regions seem to be realities, but in the absence of judgment they seem harmonious and natural, and we recognize their fantastic nature only when reason returns with the waking hours. Formerly dreams were supposed to be heralds of events to come; but now it is known that they are but the shadows of previous experiences.

† 559. Change of occupation. — When one set of brain cells has become tired, it is well to direct the thoughts to another subject and let the first set of cells rest. It is a relief to study a history lesson after working hard at arithmetic problems. A change of occupation is the best kind of rest. It is well to alternate pure brain work with work which, like gardening and carpentering, requires muscular effort.

560. Healthy bodies. — The brain depends upon the blood and digestive organs for the power with which to work. When any of the organs are acting improperly the brain is the first to suffer. The strongest brains are contained in the healthiest bodies. No kind of food is brain food more than another, but fish and phosphates are hardly so valuable as beefsteak and salt.

561. Exercise and brain work. — Muscular exercise is needed to keep the body in the best physical condition. Thus it makes the brain stronger. It also takes some blood which otherwise would continue to circulate in the brain, and thus it rests the mind after work.

If exercise is continued until the body is tired, no energy is left for the brain, but sleep comes on as soon as the body composes itself for brain work. Exercise for the benefit of the brain should be brisk in order to produce the best effect upon the circulation of the blood, but it should never be carried to the point of fatigue.

562. Nervousness. — When the brain is exhausted from overwork or from worry, it has not enough energy to control itself or the reflex actions of the spinal cord. Slight and strong sensations are equally unpleasant, and the effort to control the feelings seems to increase the suffering. Thus there arises a condition called *nervousness*.

Nervousness is a lack of self-control. The judicious expression of sympathy by a strong-willed person is the best means of overcoming it. On the other hand, sarcasm and scolding only do injury and increase the nervousness.

563. Hysteria. — An extreme lack of self-control is called

hysteria. The person laughs or cries at trivial things. The motor and sensory regions often seem paralyzed. Persons may even wound themselves to inspire sympathy. Yet there may be most violent convulsive movements. A well-marked case closely resembles the actions of a spoiled child when his will is crossed.

The treatment of hysteria is to arouse the will power. Expressions of sympathy only make the condition far worse. A firm and stern nurse can usually command obedience. Any sudden fright will generally break up an attack.

564. Insanity. — A persistent lack of control of the brain in one or more directions is called *insanity*. Nervousness often repeated and yielded to may become insanity. Worry and overwork are extremely common causes, while alcohol causes half the cases in asylums. Often the weakness of the brain cells is inherited.

A person about to become insane is changed in disposition and character. There is a lack of self-control and of judgment. Prompt rest and care of the body may overcome the attack, but a strong-willed friend will be needed to guide the treatment, for the patient thinks that everybody except himself is wrong.

565. Forms of insanity. — In insanity there are no new mental traits or possessions by demons, as used to be supposed, but only an increase of some mental acts and a decrease of others. The expression *an unbalanced mind* well describes the condition. There are three main forms of its disturbance, giving rise to three forms of insanity.

An increase or hastening of one or all mental acts sometimes takes place. The thoughts flow faster than words can express them, and so the talk is a meaningless gibberish. The senses are uncommonly alert, and one may think he hears and sees things which do not exist. He cannot understand why others are so slow and dull, and so is apt to show violent outbursts of temper. Yet although he may harm others,

he will seldom hurt himself intentionally. This condition is called *mania*, and constitutes the popular idea of a crazy person.

In a second form of insanity the thoughts flow slowly. Questions are answered in a hesitating way of which the person is conscious, so that he feels that he is incapable of doing business or even associating with men. He becomes gloomy, and imagines he has committed an unpardonable sin which he endeavors to discover. He reads his Bible, but imagines that all its curses apply to him personally. He finally tries to destroy himself so that he may no longer be a burden to his friends. This condition is called *melancholia*.

A weakening of the whole brain is the third form of insanity. Degeneration of the brain cells often occurs in old people, and is commonly called *softening of the brain*. It may occur in middle age. Alcoholic drink is a common cause of the condition.

566. Treatment of insanity. — Insane persons can usually talk and exercise some reasoning powers. A sympathetic nurse should win their confidence and control them by reason and persuasion. Special training is required to carry out proper treatment, and so it is usually best to remove them to an asylum. Most cases of insanity improve in from three to six months, and many permanently recover.

567. Delirium of fever. — In poisoning, either by drugs or by the poisons of sickness, the mind is apt to be somewhat disturbed. Anything which diminishes the fever will quiet the mental disturbance, and with the end of the fever the mind regains its right state. In rare cases, the delirium persists, and is then a real insanity.

568. Injuries to the brain. — The effects of a blow or other injury to the brain depend upon its situation. Any injury may cause unconsciousness. Injuries to the top of the brain impair the faculties situated in the injured regions, but seldom cause death. Injuries to the base of the brain are usually fatal by involving the medulla. After the effects of the blow have passed off, a blood clot remaining may still cause paralysis of the cells of a particular part so that the person may lose certain mental powers.

569. Apoplexy. — The arteries of old persons sometimes become hard and brittle so that one is liable to burst in the

brain, especially in its motor region. Then the pressure of the escaped blood injures or destroys some of the brain cells. This constitutes *apoplexy*, or a stroke of paralysis. There is usually unconsciousness for a time, followed by paralysis of some limb and of speech. Recovery is usually slow and imperfect. If the medulla is affected, death quickly results. Confusion of speech, dizziness, and tingling in a limb usually precede an attack for some days. When a person is taken with a stroke of apoplexy, he should be kept very quiet, with his head raised, so that the blood will flow through the brain as gently as possible.

570. Fits. — If the cells of the motor region of the brain are irritated, as by a sliver of bone or a blood clot, they may send impulses at intervals to produce violent movements of the muscles. This is called a *convulsion* or a *fit*. An operation for the removal of the substance which presses upon the cells will relieve the fits.

In young children, irritation of indigestible food in the intestine or of the poisons of fevers may cause the spinal cord or motor region to send out reflex orders and so produce a convulsion or fit. Convulsions in a child can be stopped by immersing it in a tub of very warm water. Then something to clear out its intestine should be given so as to remove the cause of the convulsions. In all forms of convulsions there is little suffering, for the person is wholly unconscious.

Convulsions may come without warning and produce entire unconsciousness for a minute or two, when they cease, and the person is apparently none the worse for it. This trouble is called *epilepsy* or *fits*.

During the fit there is no danger except that a person may bite his tongue. So the only thing to be done is to stuff a handkerchief into his mouth so as to crowd the tongue away from the teeth. Excitement is liable to bring on fits in a person subject to them.

571. Panics. — In times of bodily or financial danger, where many are assembled, a single person may infect the whole audience with an insane fear. Then each person thinks only of his own safety, and many are sure to be trampled upon and injured. In such a time a single cool head will do much to calm the excitement. Fire drills in school teach the pupils to be orderly in the face of danger.

SUMMARY

1. Constant effort of the will is needed to keep the thought cells of the brain acting.
2. A few repetitions of either good or bad acts produce *habits* of doing them.
3. Many mental acts are done without consciousness.
4. In sleep the thought cells rest from work and there is complete unconsciousness. Lack of mental occupation during the day, worry, and an empty stomach are common causes of sleeplessness.
5. A change of occupation is rest for the mind.
6. Active exercise, short of fatigue, improves the mind as well as the body.
7. A lack of self-control when irritated by slight sensations is *nervousness*. An extreme lack of will power is *hysteria*.
8. A persistent lack of control of the thoughts is *insanity*. The thoughts may either be hastened, or hindered, or suppressed, giving rise to three forms of the trouble.
9. In fevers there is often a temporary delirium which resembles insanity.
10. In old people, an artery of the brain sometimes bursts, and the clot, pressing upon the nerve cells, stops their action and produces a shock of apoplexy.
11. Irritation of the motor region may cause the cells to send orders for violent muscular movements, producing a fit or convulsion.

REVIEW TOPICS

- I. State how the cells of the cerebrum differ from the other cells of the body in regard to being controlled and made to act.

2. Tell how best to study.
3. Discuss persistence of impressions; habit; heredity.
4. Show how the mind acts without our knowledge.
5. Tell the nature of sleep; its use; how much is required; and when to sleep.
6. Tell how sleeplessness is produced by an empty stomach; by worry; and by lack of work.
7. Tell the nature of dreams and of what ideas they usually consist.
8. Show how a change of occupation rests the brain.
9. Show that good health is needed for good brain work, and tell how exercise affects the brain.
10. Show the nature of nervousness, and of hysteria, and tell how to overcome them.
11. Give the causes of insanity, its three forms, and its treatment.
12. Give the result of blows upon the brain.
13. Give the nature of a stroke of apoplexy, and show how it produces paralysis.
14. Discuss fits; their causes, forms, and treatment.
15. Discuss panics.

CHAPTER XXXIII

EFFECTS OF NARCOTICS UPON THE MIND

572. Stages of action. — A perfect engine acts smoothly, and with an ease of motion which suggests a delight in its work. The body is an engine at the service of the will. A derangement of any part disturbs the action of the brain according to the extent of the disorder. While little or no alcohol can ever be found in the brain, yet the leucomaines and other poisons produced by the action of alcohol reach the whole body, and produce a profound effect upon the brain sooner than upon any other part. Three stages of the effects of alcohol are well marked:—

First, there is a stage of *stimulation*; second, the cells act in an uncertain manner. This is the stage of *disturbed* action; third, the cells act slowly or even cease to act. This is the stage of *paralysis*. All three stages are often seen in drunken men upon the streets.

573. Stage of stimulation. — A small amount of alcohol causes the blood to circulate more rapidly. More food reaches the brain cells, and so they show more activity. It produces a happy state of mind in which men overestimate their abilities. Men drink mainly for this effect of the alcohol.

Some gifted men with weak wills exert themselves only when under the influence of strong drink, and from this fact many reason that alcohol increases the brain power. These gifted men hang about the saloons, eating little and drinking much. In this condition their brains receive no strength or energy to devote to any object. A drink fur-