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The Nervous System In Disease and Health

A TREATISE TO HELP LAYMEN TO A BETTER UNDERSTANDING OF THE SIGNIFICANCE OF NEUROLOGICAL PROCEDURES, AND THE DISEASES SUCH PROCEDURES MAY REVEAL

By D. O. Cauldwell, M. D.

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MYSTERIES OF THE MEDICAL EXAMINATION

Almost everyone has had a medical examination. Some medical examinations are pure superficialities. An example of the superficiality is where you open your mouth and say "Ah." Beyond the "Ah" stage many highly technical procedures are involved. For instance, counting the pulse and taking the pulse are entirely different procedures. A small child who has learned to count may count the pulse. The good doctor not only counts the pulse—he actually takes it. By this it is meant that he observes its quality, rhythm, irregularities, and numerous other factors. Heart irregularities are often revealed to the physician during the pulse count.

Anyone can observe the furred and furrowed tongue. Physicians place different interpretations upon the appearance of the tongue. This fact makes an observation of the tongue no less important, for what the physician seems to feel the tongue appearance reveals leads him to further investigation. Such investigation invariably leads to a more positive diagnosis.

The person unskilled in medicine and the fine points of physical diagnosis may be intrigued by the amplified sounds of the beating heart when listening through the stethoscope. That which is revealed to the experienced doctor within the space of a moment may be enough to fill pages with data on the heart, lung or chest condition.

To the person unversed in the intricacies of blood pressure a few terms suffice to describe blood pressure findings. Such a person usually thinks of blood pressure as high, low, normal, good, bad, or dangerous. Depending on the doctor's prejudices, the blood pressure may tell him much or nothing. To the doctor the blood pressure may be a key to the general reading in longevity. None of this makes the arm band, the stethoscope and the mercury column any the less mysterious. This is true of the versed as well as the unversed.

Sometimes in a blood pressure reading the heart sounds are not heard when the apparatus is attached to one arm. The doctor often tries the other and in many cases of dubious appearance and disappearance of the heart sound under varying degrees of pressure, he lays aside the stethoscope and seeks to establish the reading by the appearance and disappearance of the radial pulsations.

I have no idea how many thousands of blood pressures I have taken. Nor have I any idea how many times especially when doing a difficult reading persons being examined have watched the mysterious bobbing and throbbing of the mercury column on the barometer, and, with utter asininity, announced that they had read just as readily as I had. I never told off but one person on such an occasion. On that occasion I was emotionally weak because I had not had enough iodine in my diet. Or perhaps I'd been eating crab instead of fish. The man being examined was an applicant for a job—not a patient applying for treatment. He had already demonstrated that his diet had been metallogged with brass.

When the examining doctor places one hand flat on a body surface and strikes the back of it with stiffened fingers of the other hand the patient isn't much impressed. There's nothing mysterious about this procedure, or when the doctor gouges his fingers into the person being examined. The patient pays little heed unless he feels pain. Both the procedure and pain are as plain as daylight and neither harbors a hidden mystery.

Specimens for various laboratory tests may be taken without in the

least piquing the patient's curiosity. Yet the work that goes on under the microscope may offer as many mysteries as a well plotted detective yarn.

Some patients are as calm as a sultry day while an electrocardiograph is being made, while others are just about as jittery as if they were in the electric chair. Those strange little lines resulting from the procedure represent either a deep mystery or an unknown and uninteresting language.

It is when the doctor takes up a funny-acting instrument, which the average patient calls a little hammer, and starts striking here and there, and the patient begins to jerk and feel as though the doctor had found dozens of funny-bones, the real mystery enters into the medical examination. The wisest college professor may affect the silly grin of a circus clown, and the self-conscious, regardless of his intelligence level, may try to look austere or uncommonly wise. Millions of intelligent people have an idea that the involuntary contractions of various muscles or muscle groups are in some way, to the doctor, an index to the sanity or insanity of the patient.

Several years ago, while sitting in a luncheon booth at a drug store, I was amused at an occurrence involving a wiseacre of the know-it-all kind. He seemed to have an answer (correct or incorrect) for every question including the questions of how twins come about. He was explaining about an examination he had just taken for life insurance. He was, he boasted, as sound as a dollar, but he had pulled the wool over the doc's eyes time and time again during the examination. He admitted that he did not understand one of the things doctors always did. This was the well-known knee-jerk test.

A stranger who might have been, judging from his appearance, either a businessman, lawyer, or physician was enjoying a dish of ice cream at an open table well within earshot of the man who had fooled the doctor. This man asked in a serious tone: "Don't you know what that test is for?" The wiseacre admitted that he had no real good idea. The stranger returned to his ice cream, swallowed several spoonsful, and sensing that eyes were upon him, hesitated with the spoon in mid-air, and remarked: "That's to tell whether you are crazy."

Now the wise one was a successful industrial operator. His expression was that of one who has just heard the sentence of doom pronounced. He looked at the stranger for a few seconds, remarked that he had business to attend, and departed.

There is significance in the foregoing. Many highly intelligent folks have an idea that the neurological examination is definitely connected with examinations to determine sanity. This is but an indication that there is a general knowledge of the facts that neurology and psychiatry have come to be recognized as closely allied branches of medical science. But either the psychiatrist or the neurologist would be like a mariner without a compass if he depended on the findings of the other for his own conclusive diagnoses.

Neurological tests in all examinations are to determine the general state of health, and to determine whether or not certain diseases exist. Various procedures of the medical examiner are mysterious to the person untrained in medicine. The X-ray, the electrocardiograph, the kymograph, the kymoscope, and various other modalities of the laboratory represent mysterious and mystifying procedures. Neurological tests lead to the unfolding of facts which are baffling not only to the patient, but to the seasoned physician as well. The purpose of this treatise is to help the layman to grasp a better understanding of the significance of neurological diagnostic procedures, and the diseases such procedures may reveal.

WHAT IS NEUROLOGY?

Neurology, a branch of medical science, deals with, and studies the nervous system in disease and in health. Neuro-anatomy is that branch

of science which involves the study of the anatomy of the nervous system.

The nervous system has two divisions—the central and the peripheral. Other systems are mentioned and are even referred to in serious medical literature. The central and peripheral systems are the domain of the anatomist. Physicians and anatomists study the systems according to group. Groupings begin with the cerebrospinal (central) and autonomic (peripheral) systems.

THE ORIGIN OF THE NERVOUS SYSTEM

The beginning of the nervous system is first observed as a group of lines on the back of the embryo. These lines form a groove which is known as the neural (nerve) groove. What is known as the neural plate closes in from its sides in such a manner that the tissues meet and fuse (grow together), thus forming an elongated hollow space which is called the neural tube. The wide front part of the neural plate forms the brain while the narrow back part forms the spinal cord. The hollow spaces within the tube develop into the cavities that later hold the brain and extend into the spinal canal. When, for various reasons, the rudiments of the nervous system fail to develop normally in the embryo, various malformations and deformities result.

IMPORTANT STRUCTURES OF THE NERVOUS SYSTEM

The *medulla spinalis*: This is the spinal marrow which is better known as the spinal cord. It belongs to the central nervous system. Its location is the spinal canal.

The *medulla oblongata* is that part of the spinal cord extending into the brain. It is short, being about one inch in length. It is largest at its upper end. (Bone marrow is called the *medulla ossium.*)

The brain has three principal divisions. They are the fore-brain, the mid-brain and the hind-brain. The medulla oblongata is a part of the hind-brain and other divisions are the pons and cerebellum. The brain of the male weighs more than the brain of the female. The average weight of the adult male brain is nearly 1,400 grams, while the average weight of the adult female brain is between 1,200 and 1,300 grams. The maximum weight of the adult male is from 1,800 to 1,900 grams, The minimum recorded weight of the brain of the adult male is a little less than 1,000 grams. The maximum weight of the brain of the adult female is nearly 1,600 grams—the minimum, less than 900 grams. The brain reaches its maximum weight by the end of the second decade of life. The weight of the brain decreases in advancing years.

At the upper terminus of the medulla oblongata is the *pons varoli.* Important nerves, including those known as the facial nerves, arise from the pons.

The cerebellum is a hind part of the mass of brain and represents two hemispheres. The hemispheres are connected by a structure known as the vermis.

The cerebrum is that mass of the brain embracing all brain structures with the exception of the cerebellum, the pons and the medulla, lying within the skull cavity.

SOME OF THE IMPORTANT NERVES

There is the hypoglossal or 12th cranial nerve. Its body motor and sensory fibers extend into the tongue. The accessory, or 11th nerve, reaches important muscles of the neck region. The vagus nerve, which is the 10th cranial nerve, conveys impulses to important parts and organs

of the body. The glossopharngeal nerve is so similar to the vagus nerve in numerous aspects that anatomists combine its description with that of the vagus nerve. The acoustic nerve, which is the eighth cranial, actually represents two nerves; one, the cochlear, being the nerve of hearing, and the other, the vestibular, being the nerve of equilibration. The facial nerve is the seventh cranial nerve. The trifacial nerves are of the fifth pair of cranial nerves. Conditions in which a study of the trifacial nerve (nerves) is important will be discussed later. The fourth cranial nerve is known as the trochlear nerve. The third cranial is known as the oculomotor nerve. The optic nerve is the second cranial. The nerves of smell (olfactory nerves) arise from the first cranial nerve. These nerves are of vast importance and familiarity with their names may serve the layman well, not only when he is directly involved, but when others are involved— as, for instance, a person or persons injured in an accident wherein one may be said to have been at fault in factors leading to the accident.

In addition to the above nerves there are many important nerves including the spinal nerves. Various nerves will be considered in the discussion of various neurological tests, and of numerous diseases of the nervous system, or those of nervous origin or involvement.

CLASSIFICATION OF DISEASES OF THE NERVOUS SYSTEM

Diseases of the nervous system may be divided into several classifications but these are usually placed in two divisions. The first division is that involving nonspecific nervous diseases, and the second, psychoneurotic disorders. In the first division are numerous diseases which are of psychogenic origin. These are therefore closely related to diseases classed as psychoneurotic.

TICS

The simple word, tic (plural, tics) does not always indicate a disease. In most instances a tic is but symptomatic and involves repeated convulsive movements of certain muscles or groups of muscles. One form of tic is called Tourette's disease, being so named after the author, Gilles de la Tourette. This appears to be the only tic which is regarded as incurable.

A simple example of the tic is seen in people who bat or blink the eyes more or less voluntarily, and usually rapidly, sometimes with brief pauses, and rarely with long pauses between the intervals of blinking. This is not to be confused with a sensation of the eyelid (usually the upper lid) in which a twitching may occur from time to time. A simple tic is often a habitual practice. The habitual practice results, at times, from mimicry. A peculiar limp not otherwise readily explainable may be a tic. Such a tic often arises from mimicry. A clownish fellow of my acquaintance aped the limp of a man born with deformed feet until he developed a gait not at all unlike that of the man he aped. The same man was accomplished in the art of imitating the voice and manner of others. In time, the walk of the one man, and the voice and manner of speech of the other, became habitual—hence, a tic. On one occasion he did his acts of pure mimicry while becoming intoxicated. Others laughed. He laughed. For three or four hours the fun was great. The clown was, by then, completely intoxicated and went into a deep sleep. When he awoke he was unsteady on his feet, and he learned that by pushing one foot and dragging the other, he was able to walk. In this manner he managed to make his way a short distance to the saloon (under prohibition conditions) of his brother-in-law. On entering he called hurriedly for a drink in the voice of the man he had mocked so often. His brother-in-law had a hearty laugh

thinking that the gait and the voice were prankish acts. Presently, however, the afflicted man burst into sentimental weeping. He explained that he had found it impossible to walk with his normal gait or to speak in his normal voice. Being of a superstitious nature and deeply religious, he believed that he was under the curse of an affliction visited upon him by the saints for having made fun at the expense of his fellow men. The condition lasted three months and grew worse from day to day. He was taken to several so-called witch-doctors. The tic grew worse. Finally his aged aunt, who leaned but slightly toward the saints and witchcraft, and who had actually mothered the man (orphaned when a child), put her foot down hard. He was brought to me. I had treated the aunt when her recovery had been despaired. Restored health had led her further from witchcraft and other superstitions.

I was in general practice but had long been interested in, and an earnest student of psychiatry. The homeopathic theory "like curses like" came to mind and I employed what we now term narco-hypnosis. The results of the first treatment were encouraging, but nothing to boast about. The patient was given barbiturate drugs in a dosage sufficient to produce light sleep. While he lingered in this state for many minutes he was given suggestions aimed at purging his mind of his painful superstitions and fears.

For the second treatment he was taken to a health resort bath house, thoroughly relaxed and sweated. When the sweat blanket was removed he was directed to take a cool shower and while he was under the shower an attendant opened the door and yelled "Fire—fire, everybody out." The patient reached the door and the hallway in his normal gait and called loudly in his natural voice for his clothing or a blanket. He was then told that the fire was under control and to relax. A brief talk in my office sufficed to complete the "cure" and to remove the curse of the saints.

Tics invariably involve tremors, spasmodic movements and fibrillations. The latter may be manifest, yet, may not be tics. Experienced medical writers have rather generally agreed that if a condition is a true tic it will be found to be identical with a natural and voluntary act.

Blinking or batting the eyes, as previously mentioned, is one of the commonest of facial tics. Frowning becomes a tic with a large number of persons, and twisting the mouth or twitching the lips are tics which are by no means rare. There are persons who suffer from a tic which may be more annoying to others than to themselves for, indeed, they may not be at all aware of the tic. One such tic is moving the mouth or lips as if to correspond to movements of the hands and fingers when working. It is a good guess that the saying "You have to hold your mouth right," originated from this condition. Several weeks I sat in a barber chair in a dilemma of discomfort. With every snip of the shears the barber made imitative movements with his mouth. Not being devoid of a sense of humor I had to choose between outright laughter (my strongest impulse), weeping inwardly because of the poor fellow's plight, or being sedate and austere. Fortunately, I succeeded in doing the latter.

The habitual practice of tapping a tattoo with the fingers, a pencil or some other suitable object, is a tic. The person affected rarely is cognizant of the fact that he may be annoying or amusing others.

Doctors make it a rule to avoid funerals. Sometimes they must attend a funeral or give serious (and in some instances unnecessary) offense. I have been fortunate in losing but few patients and still more fortunate in that I have rarely been expected to attend funerals. Once, at the funeral of a beloved patient, a man, who was seated directly behind me, suddenly rapped a loud tattoo on the back of the hard bench upon which I sat. It sounded and resounded throughout the church building. It was impossible to divine the minister's reactions. He ceased to speak and the place seemed suddenly to have an errie air. People sat tensely on their benches. Less than a moment later a man began cracking his kunckles (this is a tic), and the amplification of the sound

seemed unbelievable. It was a relief to all present when the minister resumed his discourse, spoke rapidly for a moment or more, and called on the choir for their hymns.

Tics sometimes result from local irritations. An itching sensation may cause muscular twitching which becomes habitual. Scratching can become a tic—another tic which can readily be more annoying to others than to the positive victim.

One type of tremor may appear as a tic when, in reality, it is not. It is a mild tremor involving the face and hands, and is evident at times in the debilitated, but more often in the aged. For this reason it is classified as senile tremor. More will be said concerning this presently.

Habitual whistling may become an annoying tic. Often, it is quite embrarrassing. Now and then it is a key to emotional instability. People with this tic find themselves shunned and wonder why this is true. They do not realize that others shrink from having a person whistle in their faces—the whistle often causing the emission of droplets of saliva.

Habitual whistling, beating a tatoo and cracking the knuckles are often classified as stereotyped acts rather than as common tics. Even stereotyped acts are classified as tics although various authorities do not regard them as such. The character of stereotyped acts may not be impulsive. Those afflicted with true tics often experience periods of complete freedom from the tic. Such periods of freedom are called, by some writers, intervals of rest.

TOURETTE'S DISEASE

This disease which was mentioned as incurable is classified as an impulsive tic. Tourette called it the "tic malady." It is attended by, or associated with, mental abnormality. The basis of such mental abnormality is usually, but not necessarily, degeneracy. Tourette's disease begins most often in early childhood. It may not appear until adolescence or early after maturity. The movements consist in rapid contractions of practically all of the muscles of the body. Some physicians regard explosive utterances (often obscene) on the part of these patients as a mark of mental disease.

The localized spasms observed in hysteria are not regarded as true tics although they are, for convenience, almost invariably classified as tics.

Ordinary tics should not be confused with the disease known as tic doloreaux. This condition will be described later.

The convulsive, facial, and numerous other tics or forms of tics are classified as mimic tics. Some tics are classified as habit tics, psychic tics, and local tics.

TREMORS

Tremor is a word derived from the Latin, meaning shaking. Tremors embrace trembling, and various movements which give the impression of shaking. Some tremors are caused by drugs. Such tremors are identified with the name of the drug responsible. Tremors are also classified as coarse, fine, continuous, passive, fibrillary, metallic, persistent, purring and static. Some other descriptive terms applied to tremors are: simple, compound and intentional.

Tremors are said to be physiologic when manifested by apparently healthy people under natural and normal circumstances. Such tremors may occur in moments of great sexual stimulation. They sometimes occur during excitement. They are often associated with chills (especially when cold water suddenly strikes the body), violent physical exertion, and with convalescence from debilitating diseases.

The tremor that seems to be a quivering of muscle bundles (or of a

single muscle) sometimes accompanied by pain, and commonly spoken of as "live flesh" is known as myokymia.

Tremors involving the face, head, hands, eyelids, and even the tongue, and for which a cause is seldom established, are classified as habitual tremors. Individuals who are conscious of their habitual tremor are often able to control or to at least temporarily inhibit it. The habitual tremor disappears during sleep. Rest often causes its temporary disappearance. The person of strong psychoneurotic tendencies usually experiences an aggravated condition of the tremor under excitement, stress, strain, worry or shock which may be of a physical or of a psychic nature.

The habitual tremor has been treated successfully by such measures as tend to build up the general health. Such measures are embraced in any regimen designed to promote good hygienic living. Some such measures include a good wholesome (not fadistic) diet, exercise of such a nature as not to produce actual fatigue, a liberal amount of time in the open air and sunshine, mental relaxation through freedom from worry, and naturally, sufficient rest and sleep. Hydrotherapy in the form of various baths is helpful.

A good wholesome diet is one embracing a variety of foods, but variety must not be regarded as including a dozen or so different foods at a single meal. Variety is established when several different kinds of foods are eaten over a period of days. Diet should never include the characteristic of sameness. Other points to be remembered about a good wholesome diet are: Foods known definitely to disagree with a particular individual should not be eaten. No food (when distasteful even to the appetite) should be eaten just because someone says it is good for this or that condition. Food isn't good for any special condition. Food is either good, bad, distasteful, delectable, or worthless to, and for, an individual.

The radio commercials tell you to eat this, that and the other. They insist that whatever it is they want to sell is good for various conditions. You may be told by a dozen different sources that if you are constipated you should relieve your constipation a simple, natural way by eating this or that kind of bran. The truth is that many people may as well take cement as bran.

Spinach isn't always good for Junior. It has been learned that there are people who definitely should not eat spinach. If you ask why, or what conditions a person may have to indicate a spinach idiosyncrasy, or the abstinence from eating the weed, I must tell you again that such matters do not depend upon certain conditions, but rather upon individuals. And while on the matter of spinach not being always good for Junior, it may well be said that spinach is not always good for Senior, either. Often it would be much better for Senior to feed the spinach to a cow and eat the cow. This is not intended to prejudice anyone against spinach. It is intended to show that fadism in diet may be highly detrimental to the health and well being. If you want to eat a wholesome diet, do not eat food simply because someone who has seen you or who will never see you advocate that you eat certain food. Eat food that pleases your palate and is not known to have a disagreeable effect upon your digestive tract. And this latter should be understood here to include your elimination through the lower portion of the alimentary canal.

A word about sleep should help to clarify a much misunderstood subject which has an important bearing upon any regimen intended to benefit the general health. No person should sleep any certain number of hours each day—as, for instance, the often advocated eight hours. Whether one has slept three or four hours, or seven hours does not really matter if one awakens refreshed and rested. The practice of going back to sleep after one has awakened feeling rested and refreshed is not always salutary. If you ever do this and find, upon awakening later, that you do not feel refreshed, or that you have a heavy head (as often happens) or a headache, then you may rest assured that the practice

or habit is not a healthy one for you. If, on the other hand, you awaken refreshed but sleep again for a while and habitually awaken feeling refreshed, then the practice is either good for you or is not contraindicated.

HEREDITARY TREMOR

The hereditary tremor is known also as the essential tremor and as the familial tremor. The tremor is somewhat comparable to the vibrations characteristic of the high frequency current. This means that the tremor waves are rapid and fine in their characteristics and are often barely noticeable. The essential tremor is regarded as hereditary because it occurs more often in persons whose progenitors were known to be psychopathic or neuropathic. It does not follow that all children of a family will bear this mark nor that all of one's progenitors must have been psychopathic or neuropathic. The condition appears according to the genes passed on by ancestors. Not all children of a family inherit their genes from the same source. And, in this respect, it is to be remembered that a child may not inherit a single gene from either of its parents. Heredity is a lottery and it can never be predetermined from what ancestor one will inherit one's major genes, nor from how many ancestors one may inherit.

Certain tremors cease with voluntary movements. The essential tremor is aggravated or intensified in character during voluntary movements. It is almost quiescent during sleep, and it may entirely disappear for varying lengths of time. This is called a remission. When the condition appears to have become intensified or aggravated the condition is known as an exacerbation.

The essential tremor may resemble a tic. It may be absent entirely from a generation and may disappear entirely from a family. When present at birth it may appear at a later age in one's progeny. The tendency is, however, when it appears later, to appear earlier and earlier in succeeding generations. Treatment of symptoms palliate but treatment does not cure. The essential tremor, although remissions are frequent, continues through life after it makes its initial appearance. This is true whether it is present at birth or appears later.

TREMORS DUE TO POISONS

Such tremors are known as toxic tremors. They may result from the use of various drugs and from the sequellae of infections and infectious diseases. The toxic tremor is often labelled according to the known causative agent, as for instance, the alcoholic tremor. Numerous drugs are capable of causing the toxic tremor. Nearly all of the serious infectious diseases may be accompanied by tremors which are effects of toxic causes.

TREMORS AND SENILITY

Tremors observed in the aged, or in people who are somewhat senile regardless of age, are known as senile tremors when their characteristics fall within certain definitive classifications. The senile tremor is first noted as of a fine and rapid nature. It is further identified by the fact that it affects, notably, the face and the hands, and that voluntary movement increases the persistence of the tremor. Retardation is brought about by rest. Cessation of the tremor is observed during sleep. It causes neither muscular rigidity nor weakness.

FUNCTIONAL TREMORS

Because of the fact that functional tremors are invariably associated with psychoneurotic conditions, they may be of a broadly varying type. The functional tremor is another of the tremors which ceases during sleep.

TREMORS AS DIAGNOSTIC AIDS

The significance of any tremor should never be underestimated as a diagnostic aid, especially in lesions (particularly tumors) of the brain. There is not, always, a tremor which is characteristic of a brain lesion, but the nature of an existing tremor is indicative of its location when, in actuality, a brain lesion exists.

THE BRAIN AND NEUROLOGICAL CONSIDERATIONS

CEREBRAL ARTERIOSCLEROSIS

This condition is attributed by most writers to the elderly, but it is a serious mistake to regard a person elderly simply because of his age in years. It may be readily observed that many men are as old at 40 as many others are at 70. The physician detects a hardening of the arteries and arterioles (sometimes both), and the result is an area of coagulated dead tissue because the arterial blood supply has been impeded or completely stopped. If the area is supplied by a large blood vessel the consequences may be grave. If a small vessel is involved, the true condition may not be suspected because of the fact that the symptoms manifested are quite similar to the symptoms present in a large number of conditions.

Among the symptoms may be mentioned: Irritability which is marked by its increase and the absence of a diminishing of the characteristic. Distinct emotional instability. Dizziness and a ringing in the ears. Poor memory. Lack of judgment. Faulty judgment. Faintness. Confusion. Faulty orientation. Inability to connect or associate the names of things, and inability to place the names of persons or even the inability to recognize or identify persons. Irritability may be accompanied with behavior (conduct) which is impulsive by nature. Delusions often occur. Headaches are common and vertigo may be persistent.

The layman often associates cerebral arteriosclerosis with nigh blood pressure. The truth is that although the blood pressure may be elevated, it may not reach a higher level than may be regarded as normal to the patient.

The knee jerk reflex may early become hypersensitive or overactive, but an active knee kick is no certain sign that cerebral arteriosclerosis exists.

Physicians are careful to observe the complete analysis of the urine when cerebral arteriosclerosis is suspected, and all conditions involving the kidneys are closely observed.

THE OUTLOOK (PROGNOSIS)

The prognosis in cerebral arteriosclerosis is not always as gloomy as it may at first appear. Textbook writers do not, as a rule, paint a

promising picture. Many of these writers have marvelled at the actual trend manifested in patients brought to their attention either purposely or accidentally, or as a matter of mere routine. It seems to be the concensus of writers of medical textbooks and researchers, that once cerebral arteriosclerosis has been established as the diagnosis, any improvement may be but apparent, is almost surely transitory, and that serious (usually permanent) paralysis almost always occurs.

TREATMENT

Treatment can be but palliative or symptomatic. This being true, the patient should, if his judgment has not been seriously impaired, regard the disease as preferable, in most instances, to much of the treatment which has been recommended and employed in the past, some of which is still in vogue today.

Fortunately the trend is away from strong drug medication. Against this, however, must be weighed the truth that many of the most conscientious doctors still employ some of the very drugs that create symptoms akin to those manifested in cerebral arteriosclerosis.

Even though whole sections of the country have experienced episodes of temporary psychoneurosis and insanity among a high percentage of their population, the condition having been traced to heavy dosages of the bromides, these drugs (or this drug—bromides are frequently administered with other drugs) still enjoy a wider popularity than is commonly suspected.

A friend with whom I often had important business transactions came to me not many years ago to talk with me about his wife. She was, he explained, a physical and nervous wreck. Her condition and the care she demanded were leaving their mark on him. His work required alertness. There was heavy financial responsibility on his shoulders and he had supervision of several employees. Absolute accuracy was required of him in every transaction he made. A number of hours each day it was his duty to meet the public and to supervise every important transaction the institution employing him entered into. The local doctors had been treating his wife for some three or more years. They had finally reached a point where they gave powerful sedatives, hypnotics, and somnifacients (sleep producing drugs). One of the local doctors was a director in his firm, and he feared that a change of physicians might offend this physician who had large property holdings, and whose goodwill meant much to his institution. He was considering having his wife committed to an institution under the supervision of the state.

It was the latter idea which he actually wanted to discuss with me. He felt that his wife would receive better care should he have her committed, and that through such commitment, no one would be offended.

Questioning brought out the fact that the bromides had been the principal drug diet for months. Although apparently a physical wreck, the patient often showed signs of unbelievable strength.

Evidently the lady in question had fallen ill of some more or less obscure condition. Local physicians had felt that they knew her well enough to understand her case without extensive examination procedures. They had blundered into a blind alley and decided that there was no way of returning. One sad error led to another until they saturated the system (and especially the brain) of this poor woman with bromides.

Knowing that the trend at the state institution was away from strong drugs, I firmly recommended commitment. The patient was sent home after a few weeks. My own professional work took me away from the locality of this business friend of mine and I did not talk with him again for some four years. When I saw him I hesitated to mention his wife, fearing that, age and her previously described condition considered,

she had died and that a reference to her would but stir a painful memory. My friend seemed most happy to see me, and indeed, left his post to a subordinate in order to come and talk with me. I found it too difficult to restrain the impulse to inquire concerning his wife, but inasmuch as he had children, I inquired the easy way—for me. I asked concerning his family. All were well. He had long wanted to see me to tell me about the progress his wife made.

The story, briefly, was that she had been committed to the state asylum, and that the doctors there had immediately taken her off all drugs. She had fretted at first and complained loudly that her own doctors were real medical doctors because they used medicine. She did not even feel that the physicians and psychiatrists in charge at the state institution were medical doctors at all.

The regimen prescribed had been simple. Rest and hydrotherapy. Extremely light diet. The patient had laughed at first at the light diet. A light diet would not bother her in the least. She felt that she had eaten no more than a canary for months.

Soon, a regular regimen, continued hydrotherapy, rest, and exercise which was gradually increased, brought a change and the patient complained of the light diet. Even after she explained to the doctors that her appetite was voracious, they continued their instructions for a light diet several days longer.

When a full diet was allowed the patient ate heartily. Soon after the full diet was permitted, her periods of exercise were increased. Relaxing hydrotherapeutic treatments which had been administered to induce sleep were discontinued.

The trek through the institution became shorter and shorter. The patient began wondering about things at home. She began thinking of her pot flowers and wondering if her husband was taking proper care of them. It would soon be time for planting spring flowers. She must get the needed catalogs and order seeds and bulbs.

The doctors were slow in giving encouragement that a release could be readily effected, but as greater improvement came with the days, they telephoned the patient's husband and announced the joyous news that he might come on any convenient day for his wife.

No time was lost. The patient was referred to a psychiatrist in a nearby city. Evidently he administered psychotherapy and vitamins. The patient was now strong and healthy and threatened to outlive her spouse.

It has been my observation that doctors who do not regard the bromides as useful drugs are few and far between. I have known a few such doctors and have read after a number of others. In my early years of active practice I prescribed and dispensed the bromides. Results were always disappointing.

New and better means of treatment are being developed with almost every passing month. Medical progress was once retarded for centuries because physicians feared to contradict the medical disciple Galen. Some of the remedies of Hippocrates are in vogue today and are still useful. A few of the remedies of the ancient Egyptian physicians are employed today, somewhat different in form, perhaps, not quite similar in principle. And, the remedies of the first physicians, water, light, sunshine, air, clay, poultices of leaves, etc., are more widely employed today than ever.

This seeming digression is not actually a digression. It is intended as a warning. People with a diagnosis of cerebral arteriosclerosis should be informed that strong drugs can do them more harm than no treatment at all.

Strong measures should be considered carefully under all circumstances. A person well known to me was diagnosed as suffering from cerebral arteriosclerosis. I had definite knowledge of the case at the time the diagnosis was made by a board of authorities. Or, constituted authorities, to say the least. The person involved was in the forties. He was youthful in appearance and outlook. He took no stock in the diag-

nosis except as it affected his official status. Soon, however, by resigning from his position, he brought about changes of his own accord. There were months of great activity. Then, a serious symptom struck like a thunderbolt. Persistent headaches occurred and these resisted even that powerful (yet less harmful than it is blamed for being) drug —morphine. A neuro-surgeon solemnly diagnosed a brain tumor which he could reach through the Circle Willis. (The Circle Willis is an area of the skull which offers the surgeon no great resistance.) The patient, apparently prosperous (and actually so), simply did not have the high fee. He avoided the operation and was given sensible treatment by a young Viennese neurologist (who had been refused a license in the U.S. because he was an alien—a refugee), and was soon in the pink of health again. I have definite knowledge that this person is in better than average health today. A few weeks after his grave diagnosis, the surgeon who wanted to operate, died, and of all things, his death was due to a condition associated with cerebral arteriosclerosis, and tentative diagnosis regarded this as associated with a brain tumor. There was, at the time in question, a difference of several years in the age of the two men. The surgeon was older by several years.

CEREBRAL ANEMIA

This condition may be regarded as of the nature of a phenomenon. This is especially true when the condition is of a psychosomatic character such as occurs when the blood pressure is suddenly lowered when the sight of blood causes fainting. Blood drains from the brain. Sudden fright may be a causative agent of the condition. When a susceptible person is startled, as by a sudden sound—an explosion for example—the blood pressure may fall and fainting may occur as a result.

Hemorrhage, regardless of its location in the body, often conduces to cerebral anemia. The victim of cerebral anemia may be taken suddenly when the causative factor is obscure. An example of this would be the internal bleeding of hemorrhoids, the blood coagulating in the lower part of the rectum instead of passing out of the body. When the cause is obscure the victim may feel drowsy, or indeed, may fall into a coma. Or, he may break out in cold sweat. Often he yawns—feels as though he simply cannot get a full and satisfactory breath even though he is able to breathe deeply. The pupils may become greatly dilated. Convulsions do not attend minor attacks but there may be convulsions when hemorrhage (known or unknown) is great.

When the condition is of such a nature that the pupils become markedly dilated and there are convulsions, there is grave danger. Danger rarely accompanies mild attacks. Treatment must be according to the findings in each individual case.

Cerebral anemia is regarded as a nonspecific disease of the nervous system.

APOPLEXY

The condition known as apoplexy is known also as cerebral hemorrhage. It is not believed to occur except when there has been, for some time, a disease of the circulatory system. There are many causes. There is a powerful psychosomatic connection when an apoplectic stroke occurs concurrent with shock, fear, etc.

OTHER CONDITIONS

There are numerous other nonspecific diseases of the nervous system in which neurology is involved. The condition commonly spoken of as softening of the brain is known as cerebral softening. In the con-

dition commonly referred to as a blood clot on the brain, actually one of the cerebral blood vessels is closed or blocked by an embolus or a thrombus. If one of the lesser blood vessels of the cerebrum is involved it is rare that a seizure, or convulsion, occurs. Severe convulsions resembling an apoplectic stroke may accompany the closure or blocking of one of the large blood vessels of the cerebrum. Various forms of paralysis may follow the closure of a cerebral blood vessel. The location of the paralysis will depend upon the location in the cerebrum most affected and the nerves involved.

A condition often not suspected in persistent headaches is known as spontaneous subarachnoid hemorrhage. If bleeding is heavy the onset may be marked by unconsciousness, but there is no definite symptom pattern in the subarachnoid hemorrhage. Severe and persistent headaches with visual disturbances, formerly attributed often to a digestive upset or to ocular trouble, indicate to the well versed physician, and especially the neurologist today, that the probability of subarachnoid hemorrhage should not be overlooked. Spinal puncture (lumbar) which gives off a bloody or bloodstained fluid, indicates the actual nature of the trouble. Lumbar puncture has given relief, especially if repeated at intervals until the spinal fluid is clear. Puncture is not a sure sign of subarachnoid hemorrhage if a blood vessel is entered by the puncture needle. When the physician suspects that a vessel may have been punctured he can make a simple test to determine the true diagnosis. By centrifuging the fluid drawn off and allowing it to settle, the physician can judge by the color and appearance of the supernatant liquid whether a blood vessel was entered. A yellowish or brownish tinge is a true indication that a blood vessel was not entered.

MENTAL CONDITIONS IN NONSPECIFIC DISEASES OF THE NERVOUS SYSTEM

Mental defectiveness in which the central nervous system is usually involved is known to show a high prevalence of lues (syphilis.) Various tests indicate that more than one fifth of feeble-minded people are Wassermann positive. Lues of a congenital nature and feeblemindedness from birth go hand in hand in a high percentage of cases. Such people are backward in learning the simplest and most natural things—especially walking and talking. The bodies, if not severely stunted, are ill formed when not actually deformed. Antisyphilitic treatment seems to do but little, if any good. Many such children demonstrate clearly before school age that they are incapable of learning in schools with more normal children. When sent to school they learn slowly or with great difficulty, if at all. Usually they lean toward defectiveness in speech and cannot pronounce simple words clearly. Speech which derives from the upper part of the throat and is therefore almost unintelligible, is not uncommon. Such children early become delinquent. The majority of them show a marked tendency to steal and lie.

The feeble-minded child in the congenital syphilitic classification is incapable of keeping pace with other children. These unfortunate children should be schooled and trained apart from other children. Suitable training will not cure them but it can lead them away from tendencies to delinquency and give them a fair break which may lead, in all but the more severe cases, to partial or complete economic sufficiency.

Actual feeble-mindedness results from many causes other than syphilis. It sometimes follows severe infectious diseases. In the past it has resulted from the powerful drugs sometimes administered in these severe infectious diseases. The trend today is away from strong drugs in such infectious diseases as pneumonia, influenza, typhoid fever, and numerous gastroenterological infections.

The feeble-minded in the epileptic group are victims of heredity.

They may be useful to an extent if they are trained from infancy. The epileptic who is mentally defective is often a violent person likely to commit violence either aside from or under provocation.

Among people in the epileptic class are those who are known as the microcephalics. The stature is usually that of the dwarf. The intelligence level may rise to that of the moron but more often remains at the level of the imbecile. The head is small and cone-shaped. Both the chin and forehead recede. The face appears to protrude. The scalp outgrows the skull and lies over the bony structure in folds. The brain, when examined, shows various defects and some of its parts are so poorly developed that they fail to fill the spaces they normally occupy.

The Mongolian idiot resembles the microcephalic in certain details. This is truer of the development of the brain than of other features. The Mongolian idiots are usually marked by slit-like and even oblique eyes, the face and back of the head (at the base of the brain) are flattened. The intelligence level is more or less on a par with the microcephalic.

The mental defectiveness of senility does not always wait for what is regarded as old age to appear. It may appear early. Defective memory is one of the early signs manifest. A remarkable feature of the memory defect is the inability to recall events which are of current or quite recent occurrence. Memory defects are often covered by falsifications. The patient loses interest until he becomes so narrow of mental horizon that he is incapable of reasoning and associating facts. It is for this reason that he develops a certain tenacity, and becomes so set in opinion that, indeed, he may have but one opinion or idea. No matter how faulty this idea or opinion may be, he cannot be shaken from it.

The narrowness of the mental horizon becomes such that, because the patient is so much like a child, he may fall into sexual perversions and in this he may become a pedophiliac and get into trouble by seeking sexual intimacies with children. If he develops a tendency to wander, his memory is so poor that he may become totally lost after traveling a distance of less than a city block. Tremors and a peculiar gait may appear.

Eminent writers have advocated that senile patients should be cared for as long as possible, and in every instance possible, in the home. My personal observations have led me a long way from sharing such sentiments or advocacies.

In a community where I spent a few months several years ago, it was the practice of families (who were more or less a clan) to care for all ill members in the home. The people of the community were, as a whole, averse to hospitals. The teen-age and early twenties generation were leaning away from the old customs and toward the mores of this modern and progressive age. These younger ones preferred hospitals in serious illness.

These people were peace-loving, good workers and good livers. They paid their bills to the outside world and were marked with an admirable stripe of pride. Yet, in at least every third house was to be found a victim of some form of dementia. Senile dementia was not uncommon. In one particular instance the mother of several children became senile shortly before reaching the age of 50, and, at 50, was totally demented. Thereafter, she spent 30 years in bed—some 20 of these years in blindness. She was a care to her children and a care to her children-in-law. Her keep was inexpensive. Her diet was simple, and her clothing no more costly than cheap cotton gowns. How much more easily could she have been cared for in an institution. And, in an institution she would have had better and more efficient care. As long as the public conscience is opposed to euthanasia, then, in the name of human decency, cases like that described should be committed to institutions. They by no means receive the loving care they are often believed to receive at home in the hands of their relatives. People were in the habit of asking the children of the woman described if she "was still there."

Less than a block from the woman I have described (and related

although I do not recall the degree of relationship), an aged man spent the last 20 years of his life in bed, 15 of these years in blindness, and his care was often thoroughly negligent. So many families in the community had similar cases that they avoided discussion of them. In one such family, a senile woman (though rather young in years) who was of the violent epileptic type, was kept at home, and often tied up for hours with a strong rope. Yet her family felt that they were being kinder by not sending her away to an institution among strangers. They believed that she was happier at home. Of course she was probably neither happy nor unhappy. I had but little occasion to study her case, but I am today of the opinion that, early, something might have been done for this woman. Naturally she had never married. She attempted to induce men to have sexual relations with her. These attempts had been frustrated by natural circumstances. Few men not members of the community ever saw her. The men who knew her were afraid of her—even to the point of running from her. For one of them to have yielded might have brought severe local justice to deal with him.

Had I had more opportunity to observe the case I would now be in a better position to unravel possibilities. On several occasions when she was said to be really uncontrollable I was called. I administered sedatives. I had little chance to do otherwise and attend to my other practice. It impressed me, however, that from the first time I attended this girl she was calm and well behaved in my presence. Fear of a needle had nothing to do with this. From the first time I attended her she gave me her arm without hesitation and never flinched from the needle puncture. Her parents were afraid of her during epileptic seizures. In fact, they were so afraid that they kept a rope length's distance from her at such times. They warned me against getting near her, although, before she became thoroughly unconscious, I picked her up from where she had fallen, and on a number of occasions, took her and placed her on her bed. This girl would not have required a strait-jacket or a rope had she been institutionalized.

The nervous system, and especially the central nervous system, may be severely involved without impairing mentality. Numerous conditions which are illustrative of this will be studied later in this treatise.

VARIOUS DISEASES INVOLVING THE NERVOUS SYSTEM

Earlier we studied the anatomy of various nerves. As we now proceed to study various diseases of the nervous system, and diagnostic methods other than the clinical based upon symptomatology, we shall appreciate the help our earlier study will give us.

FACIAL HEMIATROPHY, PROGRESSIVE

This condition is interesting because of its obscurity of origin, its unmistakable appearance, and the fact that although it is distinctly a disease involving the nervous system, it does not follow the course of any especial cranial nerve or its ramifications. Its occurrence is rare.

In progressive facial hemiatrophy, the structures of one side (rarely both) of the face simply seem to rapidly wither or waste away. The condition extends even to the bones. The muscles of mastication and the tongue are affected. The skin becomes thin and the overlying skin may appear yellow, brown or bluish. The eyelashes may turn gray. Sometimes the eyelashes fall out. The nearest that the origin of the condition has been placed beyond apparent question is the central nervous system.

The condition attacks about the same number of individuals of both sexes and usually begins before the age of 30. The condition has no especial point at which to start, and may appear anywhere in the region

eventually to be fully affected. Muscular function is not impeded. Reactions to electric current do not indicate degeneration. There may be, and often are, severe pains of the nerves in the affected area.

In diagnosing the condition in its early stages, physicians find it essential to differentiate between the appearance indicating hemiatrophy and another condition involving pigment changes known as scleroderma.

This condition has not been known to respond to treatment.

PARALYSES

One of the most commonly observed forms of paralysis is technically known as paralysis agitans. The more common name is shaking palsy, while physicians refer to the condition more often, perhaps, as Parkinson's Disease, than by its technical name. The condition is chronic, of nervous origin, and is readily identified by the coarse shaking tremor which comes under control when voluntary movements are executed. The condition does not, as a rule, appear in young persons except as a result of epidemic encephalitis (inflammation of the brain.)

Aside from the tremor (shaking), one of the principal signs readily recognizable by the layman is what is often described as the pill-rolling tremor. This is observed in the fingers. The person afflicted often appears to be rolling an imaginary bread crumb between the thumb and fingers.

Parkinson's disease in older persons is believed to have a close connection with arteriosclerosis. When the condition is well advanced the face may lose expression. As the disease progresses it is common that the speech is altered or markedly defective. The gait, carriage and general baring also undergo alterations. The saliva may become excessive and the patient may drool. The act of drooling long remains somewhat under the control of the will. When as excess of saliva is observed, difficulty in chewing and swallowing are likely to occur soon. Sometimes salivation, drooling, difficulty in chewing and swallowing, all occur simultaneously.

The condition is incurable.

LANDRY'S PARALYSIS

Clinicians and pathologists are still guessing as to the cause of a clinical condition which was described in 1859, by Landry, and from whom the condition took its name. Although it may attack older persons, the condition is more or less confined to young adults. The victims, as a rule, appear healthy, and feel well. The outstanding causative factor appears to be some type of infection, evidently a side-product of any of a number of infections including influenza, paralytic rabies, pneumonia (or the existence of large quantities of the pneumococcus within the body), typhoid fever, gonorrhea, and a large number of acute infectious diseases.

At the onset, there is a general feeling of discomfort, usually fever, back pain, heaviness of the legs, and perhaps a twitching of the muscles of the abdomen. The legs become so weak that the patient soon becomes unable to walk. As a rule the ability to walk is lost in from 24 to 48 hours.

The paralysis quickly involves the muscles of the arms and trunk, and following this (with a loss of the deep reflexes) respiration. Sensation remains unaffected, or is not definitely affected. There is clearness of mind. The condition does not, as a rule, affect the muscles controlling defecation and micturition.

Landry's Paralysis differs from infantile paralysis and a number of other similar conditions because of its swift progress.

There are cases wherein the paralysis has not reached the medulla

(see references to neuro-anatomy in the first part of this booklet). In such cases it has gradually disappeared. The time for disappearance varies, but the rule is from several months to two or three years. If the disease reaches the medulla death occurs within a short time—two or three days, a week or a month, the rule being about 10 days.

BELL'S PALSY

This condition is also known as facial paralysis or peripheral facial paralysis. It involves the seventh nerve. There is still some speculation as to its actual cause. The surface appearance of the face may appear uneven (loss of symmetry), or the patient may be unable to move the muscles of one side of the face or to close one eye.

Causes ranging from exposure to cold or draughts to gout and diabetes have been considered. Conceivably the condition may result from a diversity of causes. Recovery, which is not always complete, may occur in from a few days to several months.

INFANTILE PARALYSIS

This is the well known because highly publicized *polio.* The term polio is a contraction of anterior poliomyelitis. There appears to be evidence that the disease derives from a virus, and is epidemic. A mild cold is usually present when the first symptoms of the disease are noticed. Quickly after the onset a train of symptoms develop and these include nausea, sometimes vomiting, fever, pain, headache, backache, and neck stiffness. The flaccid (limp) paralysis then appears, and thus affects as a rule, an extremity. The paralysis may be limited or extensive.

Infantile paralysis is a disease of the spinal cord. The cranial nerves are not infrequently affected and respiratory failure may occur, causing death. It was because of the respiratory feature of the condition that iron lungs were developed.

It should be borne in mind that the disease is reasonably believed to be caused by a virus, and it should be remembered in this connection that the disease cannot be diagnosed until actual paralysis appears.

Considerable progress in the symptomatic treatment of the disease has been made in recent years. Like many other conditions of an epidemic nature, this dread disease may, in time, be controlled, and thus eliminated. Strict isolation of infectious cases is, now, the best means of control or prevention.

DISSEMINATED SCLEROSIS

This condition is also known as insular sclerosis and as multiple sclerosis. It is one of the least understood diseases of the nervous system when considered from the viewpoint of the general practitioner and numerous specialists. Experienced neurologists often err in diagnosing the disease or in failing to diagnose it when it is present. Injuries of the spine often give rise to conditions which simulate disseminated sclerosis.

Highly qualified neurologists and medical writers have agreed that disseminated sclerosis is one of the commonest of organic nervous diseases and that it is rarely recognized. It resembles other scleroses, but these will be described under their proper names. Because of the fact that this disease is far more common than is suspected, and, for this reason its symptoms or manifestations are so puzzling to those who may be affected, I shall devote sufficient space to the condition to permit the average layman to get a much clearer picture of the symptoms of the disease.

Lesions of the disease are scattered throughout the cerebrospinal

axis and the symptom picture varies. Certain manifestations which clinicians associate closely with the disease may never appear.

Three classical symptoms are known as the Charcot triad. These are intentional tremor, nystagmus and scanning speech. The intentional tremor is so called because it occurs when a voluntary movement is made. Nystagmus is derived from the Greek word *nystagmos,* which means nodding. It is applied principally to various movements of the eyeballs usually described as a rhythmic oscillation. The movement may be rotary, horizontal or vertical. In scanning speech words which are ordinarily pronounced clearly by the victim, are pronounced indistinctly as though the words were tumbled one after another, and in great haste, although the rate of speech may actually be noticeably slow. The Charcot triad does not bear the important relation to the symptom picture in disseminated sclerosis it has been imputed to bear.

More important (and less stressed by various writers) in the symptom picture, are the insidiousness of the onset, notable spasticity (as though the muscles were drawn taut and nonresponsive, except slowly, to the voluntary will) and its tendency to remission.

Some of the early symptoms are not unlike the symptoms in numerous conditions. One of these symptoms is fatigability—a person tires quickly —and this is an important symptom in a large list of diseases. Another characteristic is weakness of the legs. The patient may find himself unable to lift one or both legs except by assisting the movement with the hands. Both legs may be affected, but the left leg is more commonly affected.

Patients may become uncontrollably emotional. It rarely occurs that the patient is actually hysterical although he may, at times, give this impression.

Muscular weakness is the rule but atrophy, or wasting of the muscles, seldom occurs.

Gait may become seriously disturbed.

The neurologist carefully tests various reflexes. Certain important reflexes may be lost early in the course of the disease.

Involuntary movements, especially of the lower limbs, may become common. One or both legs often tremble violently during excitement, and this seems to be especially true when, as a result of sexual congress, a climax is reached.

The cause of disseminated sclerosis is not known. It is still a practice of clinicians in general to suspect syphilis, but there is no evidence that syphilis is a causative factor. The ataxic gait (so common in diseases associated with advanced syphilis) is misleading.

Treatment is never specific. Various forms of physical therapy have been tried. As a rule these methods surpass medication for relief of symptoms.

It is not believed that disseminated sclerosis is ever cured. In many cases remissions are of such a nature that cure seems apparent. There seem to be no medical records of a cure ever having been recognized. The disease may last for many years—even for decades.

It is remarkable that many cases of disseminated sclerosis are never recognized. Affected people who have prolonged remissions may consult physicians during exacerbations, but the physician may have insufficient opportunity to observe, or may be unfamiliar with the condition, and hence is not led along such lines of investigation as would result in diagnosis.

The fact that many cases are not recognized until late is an indication that the condition is far more prevalent than statistics show.

Various injuries of the spine may produce a symptom picture closely related to the symptoms of disseminated sclerosis. This seems to be true especially when one of the intervertebral discs is dislocated posteriorly. The condition is referred to as "slipped disc." Laminectomy, when a dislocated disc has been positively identified, has given complete relief from the symptoms simulating sclerosis.

A lamina is a thin plate or flat layer. (The plural is laminae.) With reference to the spine the term refers to the flattened part on either side of a vertebra. Laminectomy is the removal of a lamina by surgery.

Various conditions involving inflammation of the spinal cord may give the appearance of disseminated sclerosis.

The person with any of the symptoms of disseminated sclerosis should not stop short of the most complete diagnostic procedures possible. This is not so important from the viewpoint of establishing that one has the disease, but rather, that one may not have the disease. Extensive examination may reveal the real cause of the difficulty, and the cause may be adequately treated. I have known of many cases which were diagnosed. Various symptomatic disturbances kept the patients searching for relief, and those who persisted learned that their condition was not sclerosis, but some correctible condition affecting the motor nerves.

While serving as a medical examiner for war industry, a man whose skin showed the markings of a spinal brace called for examination, leaving the brace at home. A laminectomy scar was plainly visible. When asked why he was not wearing the brace he explained quite honestly that he had feared the presence of the brace during a medical examination. H had been rejected for several excellent positions because of the fact that he wore the brace to the medical examiner's office. This man gave a history in which the most characteristic symptoms of disseminated sclerosis had been present. His condition had been diagnosed as sclerosis. He had, however, a few weeks before experiencing the first symptoms, fallen from a ladder while supervising construction work for a government contractor. He had been hospitalized briefly and had received workman compensation while unable to work. Within a few weeks the symptoms became so disturbing and disabling that he started on a round of clinics—at his personal expense. In doing this he spent a vast sum of money.

At every clinic there was indecision. The nearest approach to a diagnosis given by the clinics agreed substantially with that of the first neurologist who had made an examination. The clinics were not as positive, however. Their verdict was phrased as probable.

While on a motor trip, still searching for help, this patient became disturbed for fear that he would be unable to operate either the brakes or the clutch on his automobile, and sought a physician who would have him admitted to a hospital. It so happened that he saw lights in a doctor's office, and, not taking heed whether the physician was a general practitioner or a specialist, he went at once and found the doctor about to leave. Dubious because of past experience, he did not tell the doctor that he had had a diagnosis of sclerosis. Instead, he explained that he had been hurt some weeks previously and that he had not been well since.

The physician was an orthopedist and at once sought a thorough history of the accident. "You walk," he told the man, "like a man with a slipped disc." An X-ray made the following day disclosed the condition the doctor had suspected. After brief preparation the orthopedist performed a laminectomy and corrected the trouble. Not one of the old symptoms had been experienced after the operation.

My examination revealed normal reflexes. The applicant had worn the brace as a precaution—it was not essential.

During the several months that this man was on the job where I supervised all preemployment physical examinations, he kept in touch with me. None of the former symptoms reappeared. A court verdict (after the operation) gave him a sum sufficient only to cover the expenses he had incurred in seeking help.

This case illustrates how readily competent medical men may err when considering disseminated sclerosis.

PRIMARY LATERAL SCLEROSIS

This disease is regarded as extremely uncommon. Its diagnosis is so difficult that it is made by the exclusion method. By the exclusion method is meant the exclusion of all conditions having similar symptoms. Many of the symptoms are quite similar to those of disseminated sclerosis. Primary lateral sclerosis is believed to attack only in adult life.

The legs become weak and spastic as in disseminated sclerosis. The tendon reflexes of the affected limbs may appear to be exaggerated, and, as the disease progresses, walking becomes more and more difficult. There is no known cure. The cause is unknown and hence preventive treatment is not possible.

Cases of primary lateral sclerosis have been arrested, and some cases have extended over a period of three decades. In serious cases the ability to walk is eventually lost.

EPILEPSY

With the advancement of medical knowledge there has been a growing school of physicians who disagree more and more with the more established ideas prevalent concerning this disease. The nervous system is involved. The fact, according to geneticists, that epilepsy is hereditary and can be eliminated from a family by carefully planned parenthood (epileptics refraining from procreating), does not seem altogether in keeping with newer ideas.

The newer concepts associate epilepsy with various injuries and infectious diseases. They do not preclude the hereditary factor. Hysteria, brain tumor, and other conditions in which there is convulsive seizures, are often diagnosed by a person's family as epilepsy. Any sudden convulsive seizure in a person not previously thus affected should have the immediate attention of a physician. This is true even though general physicians have long followed the lethargic course of accepting a meager history, given by excited friends or relatives, and following the line of least resistance by diagnosing epilepsy. Physicians of this kind are becoming scarcer each year and it is likely that 99 times out of 100, the physician who does not make an extensive examination and inquire deeply into family history and the patient's personal history, pursues such a course because he knows that his services to such an extent are not wanted and that such services would not be paid for.

Life may be saved if a physician is called promptly when a person is seized with sudden convulsions. The physician will doubtless be thorough if he is given cooperation, and if he feels assured of the fee to which he is entitled for his work and for the investment he has in his profession.

THE NERVOUS SYSTEM AND PSYCHIC CONDITIONS
NEUROSES

The various neuroses and psychoses are often regarded as being closely associated. Some of the important common neuroses include hypochondriasis, neuroses and related phobias, compulsion neurosis, anxiety neurosis and hysteria.

Almost everyone is familiar with the lay conception of hysteria. The lay conception may be quite correct in well defined cases, but a large

number of conditions, never suspected by the laity, may have their basis in actual hysteria.

Many modern physicians and writers still regard hysteria as a condition belonging almost exclusively to the female sex. Strict medical investigators have denied that this is true. Their claim, based on extensive observation and investigation, that hysteria is as common in men as in women, is gaining wide popular acceptance.

The condition is misnamed. It derives from the Greek word meaning uterus. In early times it was believed that the uterus (womb) had much to do with the causation of hysteria.

An emotional outbreak involving, alternately, laughing or crying, or intense excitement, is commonly referred to as being of a hysterical nature. Actually, true hysteria may be far removed from such an outbreak. There may, however, appear to be a lump in the throat (also caused by sudden fright or anything startling), nausea, vomiting, inability to open the eyes, difficult respiration or smothering, intestinal disturbances, and, in women, menstrual disorders. Many women who are true hysterics "flood" when assailed by sudden grief, sudden joy, fright, and sudden and unexpected changes.

Now and then pseudo-paralysis occurs. The patient may be unable to speak or to use a limb, and indeed, may faint or go into a trance-like condition.

Various phenomena of the neuro-anatomic zones may be apparent, but medically, hysteria is regarded as a functional condition.

Nearly every doctor has a large number of patients who are inclined toward hysteria. Often they come to accept the hysterical manifestations as merely a part of each patient's temperament or disposition. Some patients would seem like strangers without their hysterical symptoms. Hysteria is, however, a neurosis (nervous disease), and is closely linked with the psychic (mental) life.

The genuine hysteric resents the idea of giving up his or her hysteria.

Sudden outbreaks yield to psychotherapy (suitable suggestion) and to sedatives. Many hysterics normalize quickly if left entirely alone and unobserved.

A person may become alcoholically hysterical. Many people, when in a state of alcoholic intoxication, seek to appear hysterical. When I was in school, I suffered one semester in a dormitory. One evening near midnight, as I walked homeward to the dorm, my attention was attracted by a group of students a block or two away from the campus. They were gathered in a cluster and, like any normal youth, I was curious enough to walk in their direction. I learned that they were shielding an apparent drunk (a student), and seeking to manage to sneak him into the dormitory unnoticed. The would-be inebriate apparently could not stand or walk alone. I observed at once that when he stumbled or fell while his fellows were trying to help him to stand alone, that he fell on the soft sod and not upon the hard pavement. I whispered this information from one student to another while each student chained the observation on to others. When the group observed the truth they left their pal where he had last fallen. Incensed, they made haste away from the scene and toward the dormitory. The pseudo-hysteric, pseudo-inebriate took a short cut and was in the dorm ahead of us. He was thoroughly angered and deeply hurt because his friends had deserted him. This illustrates the fact that the average hysteric is putting on a show or dying for sympathy. Hysterics never mind the inconveniences others suffer because of them—on the other hand, they often enjoy the discomfiture of their friends and relatives.

Hypochondriasis is often believed by the layman to be but an exaggeration amounting to an imaginary illness. The person who is an actual hypochondriac is, nevertheless, a painfully sick person. The condition is regarded as functional. Rarely are organic lesions associated with the patient's complaint found when thorough examination is made.

Conditions of which the patient does not complain are frequently found.

Recently, medical literature has contained innumerable references or comments upon the border-line features of hypochondriasis. A broad section of medical thinkers regard it as bordering on psychosis. Hypochondriasis is one of the most difficult of the neuroses to treat. Results are invariably disappointing to the sincere physician. The most astute and sympathetic doctors find it difficult not to become hardened in time.

The compulsive neurosis should be labeled as a psychosis. The true victim manifests anxiety symptoms and is almost constantly in the grip of some obsession. Many of the symptoms are similar to the symptoms of schizophrenia (dementia praecox). The patient cannot resist doing such things as making repeated inspections to assure himself that doors are locked at night. He realizes that doors are locked but he looks again to make certain. This may be repeated several times.

Many people steal under the power of their obsessive impulses. These are, as a rule, regarded as kleptomaniacs—people who steal because they cannot resist the temptation (obsession—compulsion) to steal.

One of the strangest compulsions I have ever observed in a neurotic person appeared to have had its origin in deep-dyed superstitions. The person involved is a girl 11 years old. She is definitely hysterical. And she has apparently absorbed every superstition which she has ever heard. Evidently she has not lacked opportunity to absorb. Her compulsion is so strong that she must touch everything appearing as an obstacle with the opposite hand or foot if the obstacle has been accidentally touched with the other hand or foot.

Not long ago, even though I seek to cultivate patience, I became quite exasperated, momentarily, with this child. She passed where I had some workmen setting posts by pouring concrete into the holes into which the posts were placed. A small quantity of concrete was poured into the bottom of the hole and allowed to harden before the post was placed into the hole. The posts were to be well braced and hence the holes were shallow. As this little girl passed near one hole her right foot accidentally encountered the loose earth that had been removed when the hole was dug. That foot raked a generous six inches of dirt into the hole and onto the fresh, clean concrete mixture. The accident was excusable, but when she turned and deliberately raked more dirt into the hole with the left foot, her action seemed malicious. I learned at once that she was a victim of compulsion neurosis—and, of course, forgave her. If this same child steps on a loose board while crossing a bridge, she must be certain to turn back and step on the board with the other foot. These are but two examples of the many which have led me to label her case as the strangest case of compulsion neurosis I have ever observed.

ANXIETY NEUROSIS

Anxiety Neurosis is regarded as one of the most serious of the neuroses. The illness is chronic and is believed to begin most frequently soon after adult maturity is reached. It exists in children although the fact is not given general recognition. A few months ago a little girl, an only child, whom I saw but occasionally, simply appeared to be wasting away. She should have been putting on healthy growth. Instead, she was constantly losing weight. Her parents, deeply concerned for the welfare of their only child, made repeated visits to their family physician. He examined her for a long list of conditions including the unquestionable nutritional diseases. He sought a diagnosis by exclusion, but success did not attend his efforts and the child's condition was growing worse from day to day, week to week. She ate practically nothing in spite of all of the so-called appetite-giving tonics in the book and on the druggist's shelves.

There was insanity and epilepsy in the maternal side of the family, and her father had been rejected for military service because of a minor psychoneurosis. The mother was of an unstable neurotic nature. These facts suggested that perhaps it might be well to consult a psychiatrist—just to make sure.

The psychiatrist called in an internist. When the internist advised that he could find nothing organically wrong with the child, the psychiatrist proceeded to take a careful history. He inquired closely into the child's environment. Having talked with the parents, and especially the mother, he had a rather good idea as to the roots of the child's trouble. The child was kept under severe restrictions. She was not permitted to play with neighbor children. In fact, she was hardly permitted, except when in school, to get farther than a stone's throw from her mother. She might eat something at her grandmother's, but nowhere else, notwithstanding the fact that she had close relatives all around her.

The psychiatrist's verdict was that the child was dying of loneliness and anxiety. When her environmental circumstances were changed and improvements thus brought about in her surroundings and habits of life, she made a rapid and complete recovery. Her rapid growth was almost startling. Color came to the faded cheeks. There are few healthier children in the community today.

The adult anxiety neurosis has many of the earmarks of other neuroses. The patient is often anxious and melancholy without being able to explain or give any reason for such feelings. Almost every patient feels certain that there is something organically wrong because of various physical manifestations. The condition resembles hypochondriasis in this respect. There may be smothering spells, palpitation, and the lump in the throat or choking so common in hysteria. The person with a severe anxiety neurosis is seized with morbid fears. He may even suspect that he will suddenly fall dead. There is a dread that this may occur when among strangers. Irritability, nervousness, various pains and aches, especially headaches, constipation, diarrhea and mucous colitis are other manifestations. The sex life becomes a nightmare. There is always present in the patient, except during periods of remission, a suspicion that he is far below par sexually. Sexual adjustment is naturally poor. Business may be ruined or the patient may become unable to hold a job. During severe attacks the patient is incapacitated. There may be remissions extending over weeks (rarely months), but attacks are readily induced under the least trying circumstances. Temporary anxiety concerning the outcome of an interview, whether one will be late for work, or whether one will, perhaps, miss a train, brings on under-arm perspiration, moist hands, and sighing respirations.

Anxiety neurosis may be overcome but the patient must exert strong will power. He requires constant encouragement—especially from persons whom he admires and trusts implicitly.

The phobias are many and are in the group of neuroses. They include various fears that are without actual basis in fact. The phobias are invariably manifestations of deeper neuroses and psychoses.

THE PSYCHOSES

The important manifestations observed in psychotic persons include agitated depression (which resembles in many instances the anxiety neurosis), schizophrenia, delirium (toxic psychosis) and the serious mental disease, manic depressive psychosis.

In agitated depression there is what is known as involutional melancholia. This is the chronic from of melancholia. Great anxiety exists concerning the most ordinary affairs of life—or it may be an ungrounded anxiety, as, for instance, a fear of financial ruin (the patient may own an empire).

Schizophrenia is known as the split personality disease. It develops in adolescence or soon after adult maturity is reached. The patient

avoids ordinary activities, becomes unable to concentrate, or concentrates with great difficulty, is apathetic, given to day dreams, and is subject to hallucinations. There are feelings of being affected by strange influences.

Manic depressive psychosis is often one of the least suspected of the psychoses. It is for this reason that family and friends are so severely shocked when a victim of the psychosis commits suicide. No one has had an idea that anything was wrong.

The manic depressive often holds a responsible position. In fact, he is of the type usually regarded as a real live wire. On the other hand, the necessity for hospitalization is not uncommon. A feature of the disease is that there may be months of freedom from attacks.

Attacks are divided into two phases—the manic and the hypomanic. In the hypomanic state there may be great activity, exhilaration, aggressiveness, overtalkativeness, letter writing (as if for the sake of something to do), telephoning, telegraphing, and the originating of fantastic schemes. The patient often takes up the telephone without having anyone in particular in mind to call or anything in particular to talk about—fails to think of a number, puts the telephone down, all the while engaging in conversation with one or more people. The thread of conversation may be broken while the manic person holds a long conversation. During states of exaltation the patient may identify himself with some powerful and influential person. The religiously inclined may think themselves gods.

The depressed phase of the condition finds the patient inactive, largely inert, introspective, lonesome, melancholic, unable to sleep well, and self-accusing.

Social and occupational adjustment may be highly satisfactory. It is because of this, and the patient's ability to hold a good position or to succeed in conducting his own business, that suicide seems so unexpected, unbelievable, and shocking to family and friends.

Suicide is, perhaps, the outstanding danger in manic depressive victims.

Delirium may result from various drugs and as a complication of numerous organic diseases.

Treatment of exacerbations is highly satisfactory when the true condition is recognized.

NEUROLOGICAL EXAMINATION

Numerous procedures of neurological examination are employed by the physician making a general or routine examination. Some of these procedures intrigue, while others baffle the person being examined. In a thorough neurologic examination the person being examined often finds himself performing acrobatics he had not suspected himself as having the ability to perform.

Of great importance is the neurologic history. The psychoneurotic patient may be unable, personally, to give an adequate history. This is more commonly true of the condition at, or near, the time of examination.

Data which have been given are illustrative of the importance of any history of trauma (injury), particularly injuries of the skull and back. Motor and sensory disturbances have such a bearing on the neurologic condition that an accurate description of their manifestations is of extreme importance to the examiner.

The neurologist seeing a patient for the first time is much busier than he ever appears to be. He is studying the facial expression, observing the features for symmetry or asymmetry, observing speech, mannerisms, posture, carriage and gait. If tremors are apparent these are observed and classifed. The gait may be highly indicative as a key to condition or important procedures employed in neurological examination.

Any deformity, mild or exaggerated, is observed in a cursory manner by the examiner. Such deformity may lead to a correct diagnosis—especially when the deformity is due to trauma. Speech offers another highly important diagnostic key.

Patients may be asked to indulge in various activities—and, these may, in instances, appear foolish and unnecessary to the patient.

When patients are in a stuporous state the examiner uses special procedures to determine whether certain conditions exist. The extremities are examined by lifting. Each extremity is lifted and dropped. If a limb is affected by paralysis it will be more limp and will fall accordingly. The limbs are pinched or pricked. Movement will be absent in a paralyzed limb. Normal limbs, when placed in unnatural, awkward or uncomfortable positions, will move to more comfortable positions while paralyzed limbs will not move.

Slow and irregular breathing may indicate poisoning by drugs.

Patients are asked to move in different directions in order that the examiner may determine the range of motion. When certain movements of the joints are difficult or impossible and joint stiffness attributable to injury or a disease such as arthritis, neuritis, etc., is ruled out, the examiner is led to perform tests which determine whether motor nerve disease limits the range of motion. When, for instance, the toes cannot be wilfully moved in opposite or opposing directions at the same time, or certain finger movements cannot be examined, a sclerosis or damage to specific nerves may be indicated. Any interference with bending the body forward, backward or to either or both sides, or rotation of the body or the neck may be of considerable significance to the neurological examiner.

The lumbosacral spine is often the seat of unsuspected injury or the sequelae of an injury or injuries. When the examiner places a hand on the knee in order to prevent flexion, the patient being passive, and the other hand under the heel, raising the leg, he is able to observe the point of any resistance to the movement. Trouble in the lumbosacral region is detected through this procedure, and each leg is a key indicating which, if either, side of the spine is most affected. Also, lifting the knee from the table, the buttocks being supported or braced by the examiner's free hand, aids in determining the status of low back conditions.

In the injuries arising from industrial accidents, low back pain or complaints of low back pain, are common points of controversy. Lawsuits wherein the employer or the employee may suffer in the absence of definite diagnosis when the lower part of the spine is involved, are common. This medico-legal situation served as a spur to industrial surgeons who cooperated to bring about almost foolproof diagnostic procedures through which error, in most instances, can be eliminated.

The actual existence of low back pain is often apparent in the patient's inability to explain just where the pain is located. Sometimes the pain seems to encircle the trunk. It may appear to run along one or both legs. Certain motions may aggravate actual low back pain. The direction of these motions may help to determine whether the condition is due to an injury or to a disease of the spinal cord and nerve roots. Diseases may include Parkinsonism, meningitis or infantile paralysis.

The observance of spinal curvatures are important to the neurological examiner and his observations of curvatures are important to the patient. This is especially true in the sum total of findings and an actual diagnosis.

Electrical modalities are of great assistance to the neurological examiner. By applying current to various nerve centers and denoting the action elicited, the condition of the reflexes may be brought into clearer focus than is possible without the aid of electricity.

The pin prick enables the examiner to determine whether certain reflexes have been lost or impaired. A patient cannot voluntarily control reflexes when the controlling nerves are stimulated.

When total symptoms indicate a tumor of the spinal cord, sensory and motor responses enable the examiner to establish the level of the tumor to the exact segment of the spine.

In various sensory disturbances the patient may mistake cold for heat and vice versa. The examiner may use two test tubes—one filled with rather warm water, and the other filled with extremely cold water. The patient with a serious sensory disturbance will sense heat when cold is applied and vice versa.

When a patient is unable to identify objects placed in his hands by the sense of feel, the touch sense is known to be seriously impaired.

One of the interesting procedures employed by the neurologist involves the determination of two-point discrimination. The results of the test are highly indicative. A hairpin is commonly used. The points are spread to determine the distance they must be moved apart before the patient can distinguish as to whether one point or two points are being used. The distances which are indicative vary with different parts of the body. Testing numerous areas may be quite confusing to the patient. Accurate findings may determine the presence or absence of a brain lesion. Findings may indicate the location of the lesion, and to an extent, its nature.

The vibrating tuning fork is placed at different points over certain bones of the body. This procedure aids the neurologist in determining whether there is peripheral nerve disease or whether certain of the columns of the spinal cord which convey vibratory sensations are affected. Position sense may be evaluated through findings determined by use of the vibratory tuning fork.

Position sense is also determined by tests usually regarded as odd by the patient. The finger to nose test is one of these. It is done with the eyes closed, the patient being directed to alternately place the finger (index or middle) to the tip of the nose in successive movements. The patient has difficulty if position sense is impaired. The heel to shin test is employed in determining position sense. Impairment is indicated by a poor performance.

Another important test is known as the Romberg. (The Romberg constitutes a plurality, however.) Standing with the feet close together, the patient is instructed to close his eyes. Swaying or losing balance (if these are maintained with the eyes open) indicate marked impairment of position sense.

Sense of movement is determined by having the patient indicate (with eyes closed) the direction of a passive movement of a finger or toe, hand or foot. Movements should not be exaggerated.

What is known as a reflex hammer is used in testing tendon reflexes. The patient is examined thus while relaxed. When reflexes are bilateral (as for instance the knee kicks) and are uneven, disease of the central nervous system, or of the peripheral nerves, is indicated. Reflexes are rarely normal when disease of the nervous system is present. Unequal reflexes are nor normal reflexes.

The biceps reflex is tested with the patient's arm lying across the arm of the examiner. The position enables the examiner to place his thumb on the biceps tendon of the patient. While he presses the tendon slightly, the examiner taps his thumb with the reflex hammer. The triceps and radial reflexes are tested somewhat similarly. In the triceps test the tendon is struck directly instead of through the examiner's thumb. The patellar reflexes (knee-kick) are examined with the patient sitting in a chair, preferably forward or near the edge. The feet rest lightly on the floor. The legs should form an angle of about 120 degrees. The examiner's free hand rests lightly on the thigh while with the other hand he uses either the reflex hammer of the edge of his hand to tap th quadriceps tendon just below the knee cap. The examiner supports the extremities if the patient is in bed.

The ankle jerk is tested with the patient in a suitable position. The examiner taps the Achilles tendon while flexing the foot in the direction of its upper or dorsal aspect.

The abdominal reflexes are tested by sharply stroking the areas of the quadrants with a pin, an applicator or other suitable instrument. Absence of the abdominal reflexes is regarded as an important sign in multiple (disseminated) sclerosis.

In males the cremasteric reflex is tested by brushing the inner surface of the upper thigh. If the testicle on the tested side draws sharply upward the reflex is normal. If it is absent or diminished there is likelihood of spinal tract disease.

The plantar reflex is important to both patient and physician. There may be no response (absent reflex) when the sole of the foot is brushed. The foot may flex upward instead of downward. The test (known as Babinski's) is highly important with relation to diseases of the corticospinal tract. It is normal for the foot to flex downward or away from the patient's head. This is done as if trying to push the molesting object away.

Hoffman's sign requires neat judgment. If a person is somewhat tense and with active tendon reflexes, a bilateral (both sides) Hoffman's sign may mean little. Examiners are sometimes prone to place too much credence in the indications of a positive Hoffman sign. If the sign is positive on but one side there is much more likelihood of spinal tract or central nervous system involvement. In the test, by snapping the nail of the index or middle finger, if the thumb flexes or jerks, the sign is positive.

USEFUL PSYCHOLOGY IN HEALTH AND DISEASE

Regardless of the system of the body involved in disease processes, it should never be lost sight of that all systems of the body are closely related—some, naturally, more so than others. The brain, with its conscious and unconscious processes, bears a closer relation to all systems of the body than does any other organ. Thus, the nervous system, being an extension of the brain to and throughout all parts of the body, takes on major importance as a somatic system.

Effect upon the body and its functions through the senses varies greatly in degree. We may feel downcast when we view sadness, or happy when we witness joyous manifestations. Some of us are attracted almost altogether by the appearance of the opposite sex—this involving the sense of sight. Through observation we may experience sudden shock. This may cause nausea and vomiting. Shock through observation has been disastrous for people who live too close to the borderline between sanity and insanity.

We may be angered by cold or dismayed by excessive heat. We may (and often do) become irritable when hungry or tired, or when we have experienced a serious loss of sleep.

External forces may affect us in a thousand ways. All of these effects may be altered by thought, but thought must be directed thought which is under the voluntary control of the will.

One of my patients was nervous and tense. He had grown thin and pale during several months of such tenseness. He complained of an almost total loss of sexual power and was not certain that he experienced sexual desire. He could not understand his tenseness because he felt that he did not worry—that he had nothing to worry about. He was in business and was successful. Business was good and he was constantly evolving methods for the improvement of his business. He was actually accumulating wealth and never suffered for lack of anything essential or desired. His wife was a sweet, docile, and clinging creature, attractive and well bred. He was the father of two small children who were healthy and well mannered. The children appeared to be of average, or above average, intelligence. He riled at the sedation he had been given and at the doctors who had merely told him that he was overworking. He felt certain that sedatives had undermined his health.

Every so often, as a result of his observations of customer response, he conceived an idea for a new promotion. When seized with such an idea he worked hours and hours without sleep or rest—and in fact, without thought of food or water. Water was taken automatically when the body made severe demands for it, even though thirst was never experienced. When the idea was executed he relaxed somewhat, but went ahead with his regular duties of the ordinary work day. Then, when he became so nervous and irritable that he could not get along with his employees, he consulted a doctor (usually any doctor) and was given sedative drugs. Under these drugs he relaxed—but lost more weight. His energy did not wane.

This patient felt that he knew just what he needed—tonics, vitamins, minerals and sex-pepper-upper. He would be a good patient and never miss a dose of medicine. He had come to me hoping that I would see things his way and because he had learned that I was slow on prescribing sedatives.

He had been misinformed or had not understood the person who had recommended that he see me. I explained that he needed none of the things he was seeking to prescribe for himself using me as a proxy. I did not seek to convince him of this, but reminded him that he was ill and that I was perfectly well with not a worry in the world. I didn't even worry about my patients, but worked with them instead.

Now a patient of this kind is given to argument and procrastination concerning his health or the necessary measures for regaining health when lost. It was made clear to him that my time for him was limited at the moment and that it would not be available for his arguments. He left my office in a huff, but was back the next day. He was ready, he believed, for me to be the doctor. He was a healthy man again in six months—and he was given no medicine whatsoever. His restoration to health was not easy. After he agreed to follow a prescribed course I went along with him. When he felt that he must put one of his great ideas into execution I literally lived in his home. By constant supervision I taught him to relax after conceiving an idea, and then to execute it just as he took care of ordinary routine, always leaving his desk at a regular hour. If he had energy to spare he was induced, even by challenge, to use that energy in a direction diametrically opposed to anything having to do with his business activities. An immaculate dresser, and a man to take care not to soil his hands with dirt, grease and grime, he was induced to do shopwork in his garage at home, and to dig pits, lay brick, build stone terraces about the grounds of his home, and to mix concrete, do carpentering, and other activities so far foreign to him.

A case like this is by no means simple. The patient could have accomplished the same results and learned to relax, thus escaping tenseness, had he exercised his will power—had he but had the will to do. Often, a person properly versed must furnish the will power.

The same procedure will not suit every case. There are people who are unable to do the manual labor as a part of the exercise program this man was able to perform.

When severe tension obtains, however, the activities should be directed into a variety of channels—some, indeed, requiring activity which may be distasteful. Brief periods of distasteful work often serve to relax tension. The need for relaxation does not meet resistance because relaxation becomes preferable to the work which goes against the grain.

Numerous diseases of the nervous system, and especially the central nervous system, are incurable. Victims of these diseases may render them almost powerless by pursuing a studied plan of activity.

One man with a partial paralysis of the fingers realized that he could never be cured of the paralysis. He forced himself to learn music and became dept at playing several instruments requiring delicate finger work. In this way he retained excellent use of his hands.

A woman with a severe arthritis of the hands, and with partial paralysis of the fingers, forced herself into fine needlework. The paralysis and the arthritis remained, but they were not disturbing.

The person in health will do well to observe people afflicted with disease. To emulate the examples of those who master their diseases and handicaps may in the long run serve as a better preventive of disease (especially by building a powerful resistance) than all of the serums so far invented.

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