

The vital question concerns working capacity: What are the chances for a return of working capacity, provided that had been lost? To this question the answer is, that under reasonably favorable conditions these chances are very good. They are the best in patients who try to return to work as soon as is feasible after the accident, who are young, previously healthy, and of good family history.

The prognosis which can be given in a case of neurasthenia is not always permissible for a case of hysteria. A person suffering from traumatic neurasthenia can often be brought to a condition in which he can safely return to work soon after the accident. The subjective disturbances, however, of which he complains may persist for months or years afterward. Indeed, it is very difficult to tell when they stop, and the patient may never himself admit that he is the same as he was before the accident. In hysteria, on the other hand, recovery may be longer delayed, but when it comes it is generally more complete. Few if any hysterical persons can undertake any work before the question of litigation is settled. But when that is once out of the way, a period of a few months generally, though not always, is sufficient for a fairly complete return of working capacity.

Pearce Bailey.

NEURALGIA.—DEFINITION AND NATURE.—The term neuralgia in its strict sense signifies pain along the course of a nerve. The word has been used, however, to indicate conditions in which such pain exists purely as a neurosis, to distinguish it from the cases in which inflammatory and degenerative changes are present in the nerve, to which class the name "neuritis" is applied.

Probably the majority of the neuralgias are due in part only to any primary or essential neural disorder of the nervous centres, and indicate, in addition, some irritation of the sensory nerves from without.

This is eminently true of most of the typical neuralgias of the superficial nerves, and as our knowledge of the course and pathology of these diseases advances, many of the conditions formerly classed under the neuralgias are shown to be cases of neuritis. For instance, the gradual onset and decline of certain forms of sciatica and brachial neuralgia, their protracted course, the limitation of the pain to the tract and distribution of single nerves, and the fact that the pain is apt to be remittent rather than intermittent, together with the presence of tenderness along the nerve trunk, persistent alterations in the sensibility of the skin, and even muscular atrophy and trophic changes in the skin, all tend to point to the neuralgia being secondary to a neuritis, while examination of the nerve shows characteristic changes of inflammation and degeneration.

Then there are cases, such as some of the facial neuralgias, in which the character of the pain is that of neuralgia, persistent, intermittent, and frequently in neurotic individuals; and here examination of the nerve, after the affection has existed some time, often shows degenerative changes. The question then arises, Are these changes primary or secondary—i.e., is the case a slow progressive neuritis from the start, or are these changes in the nerve secondary to the long persistent disorder of function which underlies the pain? The recent ion theory of Loeb, that the transmission of nerve stimuli is due to chemical change in the nerve substance, might well account for a permanent change resulting from constant severe pain persisting in the nerve.

Finally, there is the class of neuralgias in which the character, situation, severity, and duration of the pain are wholly determined by processes acting on healthy sensory nerves, and may be called reflex or symptomatic neuralgias. These irritative causes, however, if long continued, may induce a permanent neuralgic habit of the nervous centres.

The group of habit pains might also be classed as neuralgias, and both these and other forms may often be relieved by mental influences.

It is uncertain whether there are special nerves and

nerve centres intended for the conveyance and perception of painful impressions, but the results of experimentation and the difference in the behavior in disease of this function—if so it may be called—from the other sensory functions, lead to the belief that such may be the case.

Again, it may be that the nerves of pain are the same with the nerves for the general feelings (*Gemeingefühle*) of satisfaction or discomfort, the special sensations of relation, such as touch, temperature, and the like.

If there are special nerves and nerve centres for pain, it is probable that they are the seat of the disease in neuralgia.

It is common to hear the neuralgias of the superficial nerves spoken of as the only affections really deserving the name, and as belonging in a different category from the visceralgias and the periodical headaches, as well as from the pains of intermittent recurrence, but of ill-defined seat, to which children and feebly nourished persons, and especially neurotic persons, are liable.

In so far, however, as these painful disorders occur under similar conditions with typical neuralgias of the superficial nerves, and are themselves of unknown origin, there is much gained in treating of them both as kindred affections, and contrasting them with each other.

GENERAL ETIOLOGY AND PATHOLOGY.—An *inherited neuropathic tendency* is the most important cause of neuralgia, and it is often impossible, in a given case, to measure the degree to which its influence is felt. It is, however, a far more important element in the migraines and the visceralgias than in the superficial neuralgias, and among the latter its effect is most strongly felt in the neuralgias of the fifth pair, and of the intercostal nerves.

The exact pathological state of the nervous centres in neuralgia is not known, any more than it is in the case of the other neuroses. Some of the conditions that give rise to it are, however, better understood.

Chief among these are: *Anæmia*, which acts both by impoverishment of the blood, and by overcharging the blood with carbonic acid; the *presence of abnormal substances in the blood*, as in gout, diabetes, malaria, chronic nephritis, and metallic poisoning; *absorption of the products of imperfect digestion or metabolism*; *the impairment of the vascular tonicity*, as in fatigue; *peripheral irritations*, such as disease of the teeth, eyes, respiratory and digestive tracts, uterus, and ovaries; *chronic inflammation of the nerve sheath*; *localized anæmia or congestion of nerves or nerve centres*.

Anæmia and states of *nervous debility* or *chronic fatigue* are common underlying causes of neuralgia, even though not the whole cause, and it is almost always best to suspect them and to fortify the patient against them by ample nourishment and tonic treatment. Although anæmic and debilitated patients are more prone than healthy persons to neuralgias of every sort, this is especially true with regard to the superficial neuralgias, the sufferers from migraine and the visceralgias being often in good, even robust, health so far as any anæmic tendency is concerned.

Anæmic neuralgias are, as a rule, protracted, like their cause, but may in the end pass away rapidly under appropriate treatment.

Diabetes sometimes causes intractable and often symmetrical neuralgias, especially sciatica, even though the symptoms of the underlying disease are not marked.

Gout and kindred disorders (lithæmia) may cause neuralgia, partly by alteration of the blood, or by direct irritation of the nervous centres, and partly by inducing neuritis. These neuralgias are sometimes bilateral and fugitive, sometimes lasting, according to their origin. Visceralgias are also common in the gouty, but it is an open question whether this may not be, in part, because of the neuropathic tendency which is intimately connected with gout.

Chronic nephritis, and the vascular and nutritive disorders associated with it, may cause various neuralgias, both superficial and visceral.

Syphilis likewise causes neuralgias both in its early and

in its late stages, and here also the manner of its action may be either direct or indirect. It is also worthy of reflection, in a given case of this kind, whether the cause of the neuralgia may not be the antisyphilitic treatment which has been used, and not the disease itself.

The neuralgias due to *mineral poisoning* are apt to be bilateral, or to attack different parts successively. The arthralgias and visceralgias of lead poisoning belong in this category, but will be treated of with the other symptoms of the same origin.

Peripheral irritations cause neuralgia which is sometimes confined to the region irritated, sometimes located in distant parts, and are always to be carefully sought for and eliminated, since, even when they constitute only partial causes, they may be practically responsible for the seizures. Carious teeth may excite neuralgia in other branches of the fifth pair besides that directly irritated.

Injuries, such as *severe jars*, as in railroad accidents, or *blows*, even when they do not apparently injure any particular nerve, may excite severe neuralgias, and the same is true of *emotional excitement or mental overstrain, acute or chronic*.

The pains due to the pressure of *cancerous growths*, or other *tumors*, and *aneurisms*, though often classed as non-neuralgic, are really not always to be distinguished from neuralgia by any intrinsic characteristic. The diagnosis is often established by other indications of the presence of morbid growths, and, so far as the nervous system is concerned, is rendered probable by unusual persistence and severity of the pain, the occurrence of signs of neuritis, such as marked atrophy, contracture, anæsthesia, etc. A *bilateral distribution* of the pain is also suggestive of such a cause, pointing either to pressure upon symmetrical nerve trunks at their exit from the spinal canal, or, in the case of the brachial nerves, to a symmetrical enlargement of lymphatic glands. Neuralgia of the fifth pair has occasionally been traced to aneurism of the internal carotid.

Cold and damp weather and the atmospheric changes preceding and accompanying storms are fruitful causes of neuralgic attacks, acting no doubt in part by depressing the general nervous tone, and in part by causing congestion or anæmia of the sensitive cutaneous nerve fibres, and even increasing any neuritis that may be present.

It is proper to speak here of the relation to neuralgia of such general influences as *age* and *sex*.

Childhood is usually considered nearly free from neuralgia, but this is only true of the typical, peripheral neuralgias of protracted course. The so-called "growing pains" of childhood may fairly be called neuralgic, and children suffer from visceral neuralgias, and sometimes from typical migraine or periodical headache.

Puberty brings an increased tendency to migraine and headache, which then usually lasts until the age of forty-five or fifty. The neuralgias of acute anæmia and chlorosis occur also largely at this period, though anæmia is probably also a cause of some of the pains of childhood.

All neuralgias are most common in *middle life*, mainly because it is then that the nervous strains incident upon increased cares and exposures of all kinds make themselves most strongly felt, and act both directly and indirectly by increasing neuropathic tendencies.

Neuralgias *rarely begin in old age*, and when they do they are very intractable, perhaps because they depend upon tissue degenerations in the nervous and vascular systems. It is, however, a noticeable fact to which the writers can bear testimony that, in spite of their severity and persistency, the neuralgias of old age sometimes unexpectedly disappear for longer or shorter periods, or even permanently.

The *female sex* shows a relatively great liability to the neuralgias of neuropathic origin; the *male sex* to neuralgias of peripheral origin.

GENERAL SYMPTOMATOLOGY.—All neuralgias have in common a greater or less tendency to *periodic* and apparently spontaneous *recurrence*, but the degree to which this periodicity is seen varies greatly.

The most regular and spontaneous periodicity is met with in the malarial neuralgias and in those of mainly neural origin, especially migraine and the periodical headaches. The visceralgias recur less regularly, but their outbreaks also are frequently, to all appearance, spontaneous, that is, due to cyclic changes within the nervous centres themselves, and not to irritation from without. In both cases this tendency to cyclic outbreaks may be interrupted, and attacks precipitated, by various causes.

Besides these neuralgias of regular recurrence, persons of neuropathic constitution are often liable in some degree to spontaneous attacks of pain, of relatively short duration; but the typical superficial neuralgias of protracted course, as a rule, show but little of this tendency to periodical and spontaneous recurrence, so characteristic of the more distinctly neuralgic neuralgias. They may recur, it is true, but this is either from a recurrence of their underlying cause, or because the neuritis, which is usually present as an important complication, if not a cause, does not entirely pass away and excites the neuralgia to fresh outbreak.

Almost all neuralgias have in common a tendency to excite *vaso-motor* and *trophic changes*. The *vaso-motor* phenomena are most marked in cases of the migraines, which are often characterized by a marked pallor or redness, or both in turn, of one side of the head. These vascular changes have, in fact, been widely believed to be the essential feature of migraine, and to be directly responsible for the pain; but this is, in the writers' judgment, a mistaken opinion. Similar symptoms are seen in the other neuralgias, especially those of the neighborhood of the eye, and probably attend, if they do not cause, the changes in the glandular secretions (tears, urine, mucus, gastro-intestinal fluids), which are also very common near the seat of any severe neuralgia, and even at a distance from it. The writers have seen a sharp attack of intercostal neuralgia, for instance, of short duration and due to acute fatigue and exposure, pass entirely away with a copious discharge of limpid urine, such as often attends the close of a migrainoid attack. Finally, migraine is often unattended by any noticeable vascular changes.

The *trophic* phenomena are most marked in the case of the superficial neuralgias, and range from such changes as are obviously due to neuritis (herpes zoster and other cutaneous eruptions, muscular atrophy, and the like), to the more temporary alterations which are partly of vaso-motor origin, or due to irritation of trophic or glandular nerves, and partly of unknown origin (œdema of the skin, changes of color and increased brittleness of the hair, temporary muscular enfeeblement, impairment of the eyesight, possibly even glaucoma, etc.). The cases associated with herpes are occasionally accompanied by palsy of the muscles innervated by the affected or related nerves. The trophic changes in migraine are but slight.

It is often included in the definition of neuralgia, that the pain is confined to the *region of distribution of one or more nerve branches*, but this applies only to the neuralgias of the superficial nerves.

It is common to most neuralgic attacks that the pain is *intermittent or remittent* in severity. When a continuous dull aching is present, it may be suspected that the neuralgia is complicated by a material degree of neuritis.

For further examination of their symptomatology, neuralgias may be divided into:

1. Superficial neuralgias.
2. Migraine and the periodical headaches.
3. Visceralgias.
4. Unclassified neuralgias of irregular distribution.
 1. The *superficial neuralgias* are limited to the course and areas of distribution of one or more nerves or parts of nerves supplying the skin and adjacent structures.
 2. The principal varieties are: (1) The neuralgia of the fifth nerve, of which there are several subdivisions; (2) the neuralgia of the occipital nerve; (3) the neuralgia of the cervico-brachial nerves; (4) the neuralgia of the abdominal nerves; (5) the neuralgia of the anterior crural nerves; (6) the neuralgia of the sciatic nerves.

All these neuralgias have the following peculiarities in common: The attacks are sometimes brief, often of relatively long duration.

The *brief attacks* generally occur in persons of neuralgic habit, and under these circumstances are more likely to attack the facial, intercostal, or abdominal nerves than the brachial or the sciatic. They may occur spontaneously, or from some special cause, as fatigue, excitement, or exposure, and may pass away after a night's sleep, like an attack of migraine, the disappearance being sometimes attended with a copious secretion of urine. Gouty persons are also subject to brief neuralgic attacks; and there are other obscure disorders of the nutrition (so-called lithæmia, and the like), of which the same is true, though it is by no means easy to say whether the neuralgia is really secondary to the nutritive disorder, or both are symptoms of an underlying nervous affection. Vaso-motor changes are common in acute attacks of brief duration, leading to pallor or redness of the skin. Such attacks are often attended also by increase, preceded at times by diminution, in the secretion of neighboring glandular organs, and occasionally by œdema of the skin. These phenomena are perhaps of vaso-motor origin. Hyperæsthesia of the skin is often present.

The *attacks of relatively long duration* usually come on gradually and are recovered from gradually. The pain is not felt over the whole area of distribution of the nerve, but has its points of election, and from these points the pain spreads or darts farther. Sometimes, and especially in the case of sciatica, the course of the nerve itself is the painful region, and it is believed that it is the sensitive nervi nervorum ramifying in the main nerve trunk that are mainly or even alone concerned in the neuralgic process in such cases. General tenderness along the nerve points to neuritis, but the localized tenderness which has just been referred to, and which is confined to certain definite spots (*points douloureux* of Valleix), probably do not necessarily have this significance. These spots of tenderness are apt to coincide with the foci of pain, but do not always do so. They are usually found where the nerve emerges from a bony or fibrous canal, or where it begins to ramify in the skin. The pain is often accompanied by subjective and objective disorders of the sensibility. The former consist in sensations of prickling and numbness, or of heat or coldness.

These sensations often precede or follow as well as attend an attack. When they overlast the attack a long time, and especially if they are sharply localized, they usually indicate that the nerve has been the seat of the inflammation. The *objective* disorders are of the nature either of hyperæsthesia or of anaesthesia. The former is usually seen at the beginning or at the height of an attack, and the latter usually later. A persistent impairment of sensibility points to destruction of some of the sensitive nerve fibres from neuritis.

Trophic changes in the skin and its appendages, or in the muscles, are common and usually point to neuritis. The muscles near an acutely painful region are sometimes temporarily paralyzed without apparent cause. The hair of the eyebrow and scalp has been known to become blanched during a neuralgic attack of the fifth nerve, recovering its color later. This change of color is probably due to the penetration of air into the hair shafts.

TREATMENT OF SUPERFICIAL NEURALGIAS (*vide* also sections on Neuralgia of the Fifth Pair, Sciatica, etc.).—*Causal Treatment.*—The importance of removing the causes of the neuralgia is evident to every one, but it is not equally recognized that it is necessary to remove partial causes, no matter how many there may be. Such causes are principally: (1) Exposure to alterations of temperature and weather, to be met by suitable clothing, change of occupation, temporary removal to a drier, or, it may be, to a more relaxing climate; (2) peripheral irritations, either near or remote from the seat of pain; (3) neuritis, primary or induced (*vide* below under Electricity and Surgical Operations); (4) dyscrasias, such as gout, syphilis, diabetes; (5) fatigue, anæmia, lack of

proper nourishment. It should be remembered in this connection that a state of health sufficient for ordinary purposes may not be sufficient as counteractive of neuralgia. What would seem excessive nourishment (see under Neurasthenia), combined, if necessary, with massage and rest and cod-liver oil, arsenic, and large doses of iron, if well borne, is useful in a large number of cases.

Symptomatic Treatment.—This comprises the means used to relieve pain and to counteract the neuralgic condition and the irritability of the nervous centres. The important remedies of this class are: Quinine, aconitine, (vide under Neuralgia of the Fifth Pair), salicylate of sodium, opium, the coal-tar products, croton chloral, electricity, hydragric treatment, counter-irritation, vibration, and local manipulation in the affected region, and surgical operations. The method of use of these remedies is too familiar to need comment, except that of the last five.

Electricity is mainly useful in the form of galvanism, which is usually applied with one pole of the battery near the nerve centres, and the other near the nerve trunks of the affected part. Its special indications are for the temporary relief of pain and in the treatment of neuritis. It is probably indifferent which pole is used in the painful area, but, on the other hand, it is of great importance, in acute neuralgias, that the current should flow without interruptions and that the strength should not be suddenly increased or diminished. The electrodes should be large and well nourished with warm water. The strength of the current should not be so great as to irritate the skin, and thereby excite, instead of soothe, the patient. Moderate variations of the current strength, as made by sliding the electrodes slowly over the skin, sometimes increase the effect. In chronic cases strong currents are sometimes useful, and it is not necessary to observe the same caution as to interruptions of the circuit.

Static electricity is of value in some cases of neuralgia given either in the form of sparks or in the unipolar method of charging and discharging described by Dr. Morton.

Hydragric (or Thermic) Applications (so far as they can be used outside of special institutions) consist in the use of the local and prolonged wet-pack (*vide* under Sciatica); local bathing and showering, or, in chronic cases, the filiform douche; prolonged general warm baths (useful as a general sedative); prolonged application of ice (*vide* under Sciatica); or the application of dry warmth in the form of hot sand or salt bags.

Counter-irritation may be applied in the form of stimulating liniments and ointments, mustard, blisters, the actual cautery, or spray of ether, or of chloride of methyl.

The best liniments are those containing aconite and laudanum combined with alcohol and chloroform, or strong solutions of menthol (3 i. to fl. ʒ i.). A strong aconitine ointment (one part to eight) is said to be useful, but must be employed with great caution. These agents act not only by the irritation which they set up, but probably by lessening the sensitiveness of the skin as well. In the same way cocaine, instilled into the eye, will sometimes relieve pain in the globe and in the supra-orbital region.

Prolonged and rhythmical vibration or manipulation over an affected nerve, best done by an instrument designed for that purpose (Granville's hammer), is said to be of service, and similarly some forms of headache can often be relieved by prolonged manipulation or vibrations with the finger tips.

Surgical Operations comprise deep injections of irritants, such as water or chloroform; removal of a portion of the nerve (neurectomy); stretching of the nerve; and extirpation of the nerve roots or of the Gasserian ganglion.

Injections of chloroform have been followed by alarming results, probably by its introduction into a vein, though this is a rare event. The best way to avoid it is first to introduce the needle alone until its point comes

near the nerve, and not to inject the chloroform if any blood appears. The dose is from ten to twenty minims.

Nerve-stretching is appropriate for mixed nerves, and has been applied to almost all the superficial nerves of the body, including the intercostals. Its effect is partly to diminish the conducting power of the sensitive fibres, and thereby diminish the irritations reaching the nerve centres, partly to alter the condition of nutrition in the nerve trunks, and partly, no doubt, to exert a so-called inhibitory action with regard to the neuralgic condition of the nerve centres. The operation is not often followed by serious results if done under proper antiseptic precautions, but when large nerves are treated in this way morbid changes are occasionally set up in the spinal cord. This operation has found its greatest sphere of usefulness in sciatica, to which heading (p. 247) the reader is referred.

Neurectomy and extirpation of ganglia are considered under facial neuralgia (p. 246).

SPECIAL FORMS OF SUPERFICIAL NEURALGIA.

Trifacial Neuralgia.—The fifth pair is more frequently affected in neuralgia than any other nerves. Conrad's statistics of seven hundred and seventeen cases of neuralgia showed thirty-three per cent. to be trigeminal. This frequency is due, in part, to the exposed position and extensive distribution, many attacks being induced by disease of parts supplied by its different branches, as the teeth, nose, eyes, etc.

The forms of trigeminal neuralgia may be clinically divided into three types:

1. Supra-orbital neuralgia.
2. Reflex neuralgia.
3. Tic douloureux.

This division may not in a way be absolute, since many attacks of supra-orbital neuralgia, though implying a neuropathic constitution as a *sine qua non*, may be brought on by peripheral irritations, and thus in a way be reflex.

Furthermore, supra-orbital neuralgia may exist as a type by itself, or the nerve may be involved in either of the other two forms.

1. *Supra-orbital Neuralgia* may be divided into: A. Those manifested by constant pain. B. Those in which the attacks are intermittent. C. The periodic attacks.

A. The pain in supra-orbital neuralgia may be constant and persist for several weeks or more. In this case its character is generally described by the sufferer as twisting or boring, and radiates from above the eye to the vertex. During the attack there is generally tenderness over the supra-orbital foramen. Such attacks are frequently found with diseases of the eye, especially iritis and glaucoma, and may be benefited by treatment of these conditions. The supra-orbital neuralgias associated with herpes are apt to be very persistent.

B. The *intermittent* type is generally characterized by making its appearance in the early morning and continuing with great severity till two or three o'clock in the afternoon, when the pain subsides, only to recur on the following day. This type, from its intermittent character, was once thought to be always due to malaria; and the fact that large doses of quinine, given three or four hours before the paroxysm is due, has generally proved beneficial seemed to corroborate this view.

In this locality, at least, it is usually a sequel of a coryza which extends upward, causing a catarrhal inflammation of the frontal sinuses, to which the ophthalmic division sends sensory fibres, and free drainage of these sinuses is essential to recovery. This intermittent type, however, may persist as a neurosis or habit neuralgia long after its original cause has gone.

C. The supra-orbital neuralgias which come periodically at more or less regular intervals form a group by themselves, the attacks often being foreshadowed by marked gloom and depression of spirits.

These attacks may be accompanied by eye symptoms and vomiting, and after lasting a definite period of time disappear. This migrainoid type derives its name not

only from the character and periodicity of the attacks, but from the fact that it sometimes alternates in the same patient with typical attacks of migraine. Moreover, there are patients who suffer from migraine from childhood till adult life, when the character of the attacks changes and the migrainoid neuralgia takes the place of the old headache.

2. *Reflex Neuralgias.*—The characteristic of the reflex neuralgias is that they stay until the cause is removed. The most common form is that due to diseases of the teeth, especially where cavities have led to exposure or disease of the pulp. They may also be due to changes in the alveolar processes, or to swelling and thickening of the periosteum of the bony canals through which the nerve passes. More rarely they are caused by aural disease.

The pain in this group of neuralgias is usually constant or jumping, though it may be paroxysmal, simulating tic douloureux. It is possible that in some cases true "tic douloureux" begins as a reflex (tooth) neuralgia. Against this, however, is the fact that the teeth have so often been drawn without benefit. Moreover, these reflex neuralgias often occur before the middle period of life.

3. The third type of trifacial neuralgia, *Tic Douloureux*, is to be sharply distinguished from the other forms. It begins in middle or advanced life and runs a characteristic course. The pain is located in the area of distribution of the second, or the second and third divisions of the fifth nerve, more rarely involving the first or all three branches. It generally starts in the upper lip or at the side of the nose, and is described at times as flashing upward along the nerve, at times as radiating outward like a pinwheel. It is paroxysmal in character, the attack being lightning-like in onset, of extreme severity, and lasts about a minute, disappearing as abruptly as it came. During the attack there is flushing of the affected side of the face, with twitching of the muscles, and often there are lachrymation or salivation and a serous discharge from the nose. The lightest touch or draught of air will precipitate an attack, while the patient dare not speak and refuses to eat solid food, so great is his dread of the pain.

These paroxysms come from several to many times a day, for periods of a few weeks or months, after which the patient may be free from them for an interval of several months. It is oftentimes a striking feature in these attacks that the pains occur with great frequency during the day, while the sufferer may go to bed at night and sleep unmolested.

The rule is for these alternations between periods of pain and periods of relief to persist over long intervals of time. It is not uncommon to see patients who have suffered for fifteen or twenty years.

Pathology.—Tic douloureux has been considered due to degenerative changes in the Gasserian ganglion, as described by many investigators. Coenen, however, maintains in a recent article that these changes are secondary to peripheral operations previously done for relief of the pain.

Degenerative changes of varying intensity have been shown to exist in the nerves by many investigators. Whether these are the original cause of the pain, or whether they result from the continued severe paroxysms cannot be decided with certainty.

Some investigations have demonstrated an endarteritis in the vessels supplying the affected nerves, at times resulting in marked diminution in the lumen of the vessel. This may be a factor in many cases by giving rise to nutritional disturbance.

The *treatment* of tic douloureux is medical and surgical, and the former should be given a thorough trial before the latter is undertaken. If the medical treatment is successful, the immediate attack is prematurely terminated, but permanent cure is rarely experienced. This, however, is often all that is accomplished through the peripheral operations, though the results of the latter are more constant.

Besides the so-called "overfeeding," and the observa-

tion of general hygienic rules, the following drugs, out of the large number recommended, give the best results:

Aconitine (the crystallized alkaloid) is best given at first in doses of gr. $\frac{1}{100}$ to gr. $\frac{3}{100}$ every two to three hours, in pill form or solution; then if no unusual susceptibility shows itself, in doses of gr. $\frac{1}{100}$ to gr. $\frac{1}{50}$ or even more, though this amount is rarely passed without the patient's complaining of severe tingling and numbness of the extremities and sometimes of a sense of coldness and faintness. A moderate degree of these symptoms does not contraindicate the continuance of the treatment for some days, or even weeks, if the patient is otherwise in good health and is constantly under observation. Tincture of aconite root can be substituted if necessary, but is less certain in its action.

Gelsemium may be given in any reliable preparation until the signs of physiological action appear, the most characteristic being a drooping of the eyelids.

Castor oil certainly does good in some cases, if given every morning on rising, in half-ounce doses, increased to one ounce as the patient becomes accustomed to the drug. Purgative effects often fail to appear after the first few doses, though the remedial action persists.

Iodide of potassium has many advocates and certainly does seem to do good in some cases, especially if given in moderately large doses.

Strychnine in massive doses is recommended by Dana, in cases of not over four or five years' standing. He keeps the patient quiet in bed and administers the strychnine subcutaneously, starting with gr. $\frac{1}{10}$ once a day, and gradually increasing until gr. $\frac{1}{4}$ or gr. $\frac{1}{2}$ is reached. This should be given for four or five days, and then the dose gradually diminished. This should be followed, he says, by an iodide-of-potassium treatment.

Opium given in gradually increasing doses till the pain is controlled is advocated by La Tourette, who claims very satisfactory results from it.

Surgical treatment consists in the *peripheral operations*, which may be regarded as palliative, and the extirpation of the Gasserian ganglion, which gives permanent relief in most cases.

The peripheral operations generally consist in cutting down on the offending nerve—the customary points being at the dental canal, infra- or supra-orbital foramen, or sphenomaxillary fossa—and in twisting and pulling out as much of the nerve as possible. This procedure usually gives freedom from pain lasting from a few months to two years. Occasionally a patient will be relieved for three or four years, and some cases of cure have been reported. The average relief from forty-three such operations, recently collected by the writers, was ten months. Three or four peripheral operations had often been performed on the same patient. The *Gasserian-ganglion operation*, first done by Rose, ten years ago, is regarded as the only means of affording permanent relief, though it is attended with considerable danger, owing to the location of the ganglion and the liability to hemorrhage. Horsley has performed this difficult operation twenty-one times, with only two deaths. The reports of two hundred and one operations, collected by Türk, show that in seventeen per cent. of the cases the patients died as a direct result of the operation; ninety-three per cent. of those who recovered were considered to have been permanently cured. This percentage of cures is, however, open to some criticism, for sufficient time had not elapsed after some of the operations to make it sure that a cure had been effected. On the other hand, the recurrence of pain after some of the earlier operations may have been due to the incompleteness of the operation.

Spiller and Frazier have recently brought forward the question of division of the sensory root of the ganglion as a radical operation. This was tried twelve years ago by Horsley and resulted fatally. It has never been attempted since then until last year, when it was recommended as being a simpler operation, and as attended with less danger of hemorrhage than the extirpation operations. It is an important recommendation of this procedure that it leaves the motor root intact. The only

uncertainty is that regeneration of the sensory root may later take place with return of the pain. How great this danger is can be shown only by time.

Occipital neuralgia is generally an affection of the occipitalis major and minor and the great auricular nerves. It approaches the neuralgias of the fifth nerve in severity and in its tendency to assume the epileptiform type, and often superadds itself to them, especially to the supra-orbital variety, by extension. In its typical form it is commonly unilateral, and this, together with its history and the character of the pain, usually serves to distinguish it from the occipital headache met with in neurasthenia, chronic nephritis, intracranial tumor, and eye strain.

In the *treatment* a diligent search should be made for organic disease of the vertebrae and surrounding tissues. This failing, salicylates or coal-tar products or the above-named antineuralgic remedies may be employed for relief of the pain. Galvanism often acts favorably in this form of neuralgia. If, however, the pain proves intractable and relief cannot be obtained from medicine, surgical interference may be resorted to and resection of the nerve may be done. Intradural resection of the posterior root has recently been performed with successful results.

Brachial and Cervico-brachial Neuralgia has the distribution which its name implies, and the characteristics of a typical superficial neuralgia. Like the rest, it is often due to injury or neuritis, the latter sometimes being secondary to affections of the shoulder-joint, but it may occur simply as a sign of debility or a neuropathic diathesis, or from concussion accidents and the like.

The pain usually centres in foci, such as the point of the shoulder blade, the insertions of the deltoid, the neighborhood of the supinator longus muscle, the wrist, and more rarely the fingers, and radiates upward or downward from these points. The hand and even the whole arm are often the seat of sensations of numbness and tingling due perhaps to congestion of the nerve, or to disorders of the circulation of vaso-motor origin, or to neuritis, and these sensations sometimes substitute themselves for the neuralgic pain.

The *pathological diagnosis* should take into account the possible presence of cancerous cervical glands, pachymeningitis cervicalis, spondylitis deformans, and Pott's disease (bilateral pain, muscular atrophy, rigidity of the neck), or of angina pectoris.

Occupations and professions requiring constant use of certain groups of muscles of the arm often give rise to extremely obstinate and troublesome pain, which, however, does not follow the course of any particular nerves, but is generally increased by motions involving the much-used muscles. It is not a muscular affection, but probably comes best under Oppenheim's head of psychalgia brachii.

The chief point in *treatment* of this form is rest of the affected member, but recovery is accelerated by general tonics and static electricity. The treatment of brachial neuralgias in general is that of the other superficial neuralgias. Surgical treatment by nerve-stretching is possible at any point, even as high as the cervical plexus.

Intercostal Neuralgia is one of the commonest neuralgias of debilitated subjects, especially women, and of persons of nervous temperament. The intercostal nerves are surrounded at their origin by large venous plexuses, and are thus liable to suffer from any sluggishness of venous circulation. Neuralgia from this cause is more frequent on the left side, since there is greater obstacle to the emptying of these vessels. It is also met with in connection with brachial neuralgia, or with neuralgia of the thoracic or abdominal viscera. It is often associated with herpes ("shingles"), and then the pain may occur two or three days before the appearance of the rash. It may pass off with the healing of the vesicles or may persist for weeks or months. In many cases of intercostal neuralgia there are tender points at the seat of the pain, which is usually greatest over the side of the chest at the exit of the lateral nerve branches. Often a tender point is also felt at the exit of the dorsal or anterior branches. The path-

ological diagnosis should consider intrathoracic cancer, Pott's disease, aneurism (all of which would be likely, but not certain, to cause bilateral pain), and pleurodynia. In all cases the heart, pleura, stomach, and gall bladder should be carefully examined for disorders. The treatment should be at first directed toward improving the debilitated and anæmic condition so often present. Blisters are often useful in cases not associated with herpes. Iodide of potassium, salicylates, or quinine in large doses may be given with benefit.

Ilio-lumbar Neuralgia needs no separate notice except to remark that it is often found in connection with affections of the uterus and ovaries.

Anterior Crural Neuralgia is not very common and needs no separate notice. The pathological diagnosis should consider the possibilities of hip disease, osteoarthritis of the spine, and pelvic tumor.

Neuralgia Paræsthetica.—The symptoms of this condition, as the name implies, consist of paræsthesia and pain, and these are located over the area supplied by the external cutaneous nerve of the thigh. The surface involved usually extends from the crest of the ilium to the knee, on the outer aspect of the thigh, though only part of this may be affected. There is frequently a tender pressure point just below the anterior superior spine of the ilium. This disease may result from trauma, but is commonly seen in people with a rheumatic or lithæmic tendency. The treatment consists in hydrotherapeutic measures, massage, and remedies directed against the constitutional tendencies. The disease is not a very serious one, but often resists treatment almost indefinitely.

SCIATICA is one of the commonest and severest varieties of superficial neuralgia, both on account of the exposed position of the nerve, which renders it liable to injury both within and without the pelvis, and also from causes which are more subtle and less well understood.

The causes of sciatica are: local injuries; primary neuritis, as in herpes zoster; exposure to sudden alterations of heat and cold; intrapelvic diseases, even when they do not directly involve the nerve itself, as uterine disease for example; gout, diabetes, and the various constitutional affections which impair the quality of the blood or the general nutrition. Cancerous disease within the pelvis may, by pressure, give rise to pain which is hardly to be distinguished at first from sciatica, and this cause should be suspected if the symptoms are bilateral, unusually persistent, or attended with marked signs of neuritis, such as anæsthesia, localized numbness, and pricking, muscular wasting, and especially if other nerves are involved at the same time. Chronic inflammation of the tissues around the hip may also give rise to pains which could be readily mistaken for sciatica. It is very important, and usually perfectly easy to distinguish the pains of locomotor ataxia from those of sciatica. The former are bilateral, not confined to the distribution of the sciatic nerve, momentary in duration, and usually affect, by preference, small spots in the fleshy parts of the limb, the knee, or the heel, or dart down the leg and disappear again.

Osteoarthritis of the spine is commonly mistaken for sciatica, the pain in this affection being caused by involvement of the nerve roots in the inflammatory exudation along the vertebrae. This gives rise to pain which is often distributed in patches, along the areas of distribution of these roots, over the front and side of the thighs and legs. Many of the curvatures described as sciatic scoliosis by many authors are really signs of osteoarthritis, and are due to muscular spasm on the unaffected side of the spine, in attempts to relieve the involved nerve roots from pressure. This condition is recognized by the marked muscular rigidity on the unaffected side of the spine. The motion of the vertebral joints is quite free when the patient bends toward that side, while the lumbar spine remains perfectly rigid on any attempt to bend forward or toward the affected side.

Symptoms.—The distribution of the pain in sciatica may be coextensive with the distribution of the whole nerve, but oftener it centres in certain regions which

may vary as the attack goes on. Such are the sacral region, the neighborhood of the sciatic notch, the back of the thigh, the popliteal space, the calf, the outer side of the leg, or the outer side and dorsum of the foot. Sometimes the course of the nerve itself is marked out by darts of pain. "Tender points" are found at the sacroiliac synchondrosis, the sciatic notch, the popliteal space behind the head of the fibula, behind the outer malleolus, and often at other places as well. Some cases of sciatica are of short duration and seem to be of purely functional origin, while in others neuritis plays a large part in the production of the symptoms, causing persistent pain, loss of sensibility, cutaneous eruptions, coldness, and wasting, and increased pain on motion, voluntary or passive. Even where these symptoms are absent, and where the pain is fully intermittent, the absence of neuritis cannot be confidently asserted in cases of long standing.

The *prognosis* of sciatica depends upon its cause. Except when it is dependent upon some temporary irritation, however, it lasts usually for weeks or months, or even longer, and is liable to relapses and recurrences. The sciatica of diabetes is said to be peculiarly obstinate, even if the usual symptoms of the disease are not severe.

The *treatment* of sciatica varies with its causation and its stage (*vide* also under General Treatment). The removal of diathetic taints, absolute rest, superficial blistering, counter-irritation by a spray, of ether or of chloride of methyl, the local wet-pack followed by vigorous rubbing with cold water and by warm applications. If access is obtainable to a hydrotherapeutic institution, the Scotch douche may be used with benefit. Galvanism with long-continued mild currents, cutaneous faradization, are always in place, and turpentine, quinine, iodide of potassium, or salicylate of sodium in full doses, may be given in fresh cases for limited periods with some hope of relief.

In chronic cases the remedies may be proportionately vigorous. The galvanic applications may be as strong as the patient can bear, and special pains taken to localize the current on the nerve, at the sciatic notch, and in the popliteal space, by pressing the electrode inward, and seeking to excite referred sensations at the periphery. It probably makes no difference whether the anode or the cathode is employed over the nerve, or whether the current is occasionally interrupted. Indeed, a series of sudden reversals of the current are often of service. Static electricity in the forms previously mentioned (*vide* General Treatment) is of value in these cases. Deep massage along the nerve, even if painful at the time, may be of great value, probably by removing inflammatory exudations. Ice-bags may be applied continuously along the course of the nerve, and deep injections (*vide* under General Treatment) are serviceable, though not without danger. When other means fail, "nerve-stretching" may be used, and, indeed, under proper antiseptic precautions, it is not a dangerous operation in itself. It has, however, been shown that the effects of the traction are felt in the spinal canal, and myelitis has in a few instances been excited. A substitute operation is the so-called "bloodless stretching," in which, the patient being under ether, the thigh is forcibly flexed on the pelvis and the leg extended at the knee, and this position maintained for some minutes. That the nerve can be stretched in this way is beyond question; but it may be doubted whether the method is really safer as regards its secondary effects than that of the exposure of the nerve by a single incision, and the use of a measured amount of direct traction, upward and downward in turn.

Coccygodynia.—This is a severe neuralgic pain in the region of the coccyx, occurring almost exclusively in women. The pain is marked on sitting or during defecation and micturition, and the end of the coccyx is exquisitely tender to moderate pressure. The condition occurs almost always in neurotic individuals, but may be brought on by trauma or difficult labor. It frequently runs an obstinate course and is best treated by tonics, counter-irritation, hydrotherapy, or galvanism. Excis-

ion of the coccyx may be performed, but often fails to give relief.

It might be well to speak here of the importance of examining the feet in all cases of vague and obscure pains in the legs, knees, thighs, and hips, for the greatest variety of sensations, from constant dull aching or burning to sharp neuralgic twinges, may have their origin in weak or broken-down arches, and immediate relief may be obtained from proper treatment. Metatarsalgia is but one instance of this sequence.

Migraine—*vide* the article on *Headache*.

VISCERAL NEURALGIAS.—The visceral neuralgias are of great importance, both on account of the suffering which they cause, and because of their constitutional significance. They occur, like the other neuralgias, partly from general nervous causes, such as fatigue, gout, and other constitutional diseases of the nutrition, and especially the neuropathic tendency, and partly as a result of functional and organic disorders of the viscera. To what extent actual neuritis occurs as a cause is not yet known, but it is certain that chronic inflammation of the nerves is often set up by organic affections of the organs, such as the heart, to the neighborhood of which the pain is referred.

The pain of the visceral neuralgias is usually deep-seated, vaguely located, and dull, but at the same time intense and prostrating, and sometimes attended with faintness, nausea, sweating, and often disorders of the circulation and secretions. Though not sharply localized visceral neuralgias take their name from the organ in the neighborhood of which they seem to be situated, as the pharynx, the esophagus, the heart, stomach, liver, bowels, ovaries, uterus, rectum, testis, etc.

Angina Pectoris (see Vol. I., p. 227), though a true visceral neuralgia, is so often a symptom of heart disease that it is usually described in that connection. It may, however, be mentioned here that it occurs not infrequently, though hardly in its severest forms, entirely independently of organic disease. In a case known to the writers, for instance, it occurred during a considerable period on the slightest exertion, such as rapid walking, in a lady suffering from temporary debility from overwork, and was each time attended with breathlessness, and with pain and numbness in the left arm, yet eventually passed entirely away. Various other such cases are on record.

Dull pain felt during the intervals of the attacks is looked upon as perhaps indicating neuritis of the cardiac nerves, but in such cases cardiac disease probably exists as well.

It is an interesting question whether nitrite of amyl, which acts so well in angina pectoris of organic origin, would be beneficial also in the functional cases.

The treatment should be, in the first instance, tonic, and in the attacks itself diffusible stimulants and analgesics would be in place. Besides the outspoken diseases of the heart, increased vascular tension should be sought for, and signs of Bright's disease, as well as functional irritability of the nervous cardiac apparatus, such as result from physical overstrain and from abuse of tobacco and other cardiac stimulants. Under these circumstances digitalis or other heart tonics might be indicated.

When the attacks are of frequent occurrence electricity, either by the superficial use of the wire brush and faradic current or in the form of galvanism, is said to be of service, as is also counter-irritation over the chest.

Gastralgia (gastrodynia, cardialgia, gastric colic) is perhaps the most common form of visceral neuralgia, and in its widest sense covers a variety of sensory symptoms, ranging from sensitiveness and pain accompanying the act of digestion, and perhaps accompanied by signs of delayed or imperfect digestion, yet not due to gastritis or ulcer, to severe paroxysms of pain entirely unconnected with the digestive process.

The etiology is similar to that of the other visceral neuralgias, but it is met with in young children oftener than the rest. It is especially common in gouty subjects and in persons of nervous, mobile temperament, and the

writers have several times seen slight symptoms of this general character at the time of the menopause.

The pain in gastralgia is felt primarily at the epigastrium, and radiates thence upward in the direction of the esophagus, and through toward the back, besides laterally through the abdomen. Allbutt ("Visceral Neuroses") says that it may be associated with anginiform attacks, and it may be attended likewise with superficial neuralgia of the abdominal walls and other parts of the body, as the face.

The relation of gastralgia, as well as of the other sensory visceralgias, to the functional affections of the viscera is very important and calls for further study. There is no question that many digestive disorders which attend gastritis, or even cancer, may also occur as pure neuroses, and it is likewise evident that there is a whole range of nervous disorders, sensory and motor, of which these purely painful affections form only one division.

Treatment (*vide* also under General Treatment).—The vices of nutrition and assimilation should be corrected, such as are seen in gout, and evinced also by a variety of nervous symptoms often described under the head of lithæmia, and sometimes attended with the presence of free uric acid or oxalate of lime in the urine. Constipation should be corrected and the diet regulated, but not necessarily reduced to a very small amount, even if digestion is attended with pain. Sometimes it will be found that one kind of food will agree better than another without apparent reason, and, when the gastralgia is associated with serious disorders of the digestion, it may be that a patient who does very badly at home will get on very well if removed from home and placed under the care of a nurse. Indeed, the most significant fact to bear in mind is that, as a rule, it is a general nervous condition which needs treatment, rather than the special symptoms.

Belladonna and the antispasmodics, such as asafetida and valerian, besides the gastric stimulants, are of more service in gastralgia and the other visceral neuralgias than their anæsthetizing influence would suggest. Morphine must be resorted to if necessary. Deep pressure sometimes gives temporary relief.

It is not necessary to review in detail the neuralgias of the other abdominal viscera and of the genital organs. Attention has already been called to the fact that affections of the uterus and ovaries may give rise to neuralgiform affections in distant parts of the body, or in the distribution of the lumbo-abdominal nerves; but besides this the uterine and ovarian nerves themselves are sometimes the seat of neuralgia, not to speak of the pain of dysmenorrhœa, which is, doubtless, in part, of that character.

Neuralgia of the liver is said to be sometimes attended by swelling of the liver and by jaundice; but here, as frequently in the case of the abdominal neuralgias, it is difficult to guard carefully enough against mistaking an organic disease for one of the concomitants of a neuralgic attack.

Neuralgia of the anus and rectum is a well-marked and painful affection, and the tendency to it may be hereditary. The seizures may come on spontaneously, especially after fatigue, or may be excited by slight irritations, such as the passage of hardened feces, or may follow sexual intercourse or seminal emissions. The pain may be accompanied by clonic spasms of the perineal muscles. The rapid injection of hot water into the rectum, or hard and deep pressure with some smooth object will often stop the attack, which otherwise is liable to last for one or two hours.

Besides the more or less typical neuralgias there are a number of other painful affections, of spontaneous origin or provoked by trifling irritations, and of unknown pathology, which occur usually in persons of neuralgic or neuropathic tendency, and are therefore fairly to be classed as neuralgic, although they do not follow the distribution of a special nerve. Such are pains referred to the skin, the muscles, or the joints, not attended by signs

of local inflammation or by any appearance of local congestion or anæmia, and capable of coming and going with greater or less rapidity. The "growing pains" of anæmic children are of this order, together with a similar affection sometimes met with in adults; also the "general neuralgia" of anæmic patients, and those dermatalgias which are not due to the organic irritation of sensitive nerve fibres, such as occur in locomotor ataxia and neuritis. The arthralgic pains of false (hysterical) joint disease might perhaps be included.

The therapeutic indications are, primarily, to improve the constitutional and nutritive condition, and to relieve the pain by local or general baths or liniments, or by anodynes.

James J. Putnam.
George A. Waterman.

NEURASTHENIA.—The term *neurasthenia* ("nervousness," or *nervous weakness* or *prostration*) has come into general use to indicate certain states of the nervous system of which the anatomical basis is unknown, but which are characterized, on the one hand, by a lack of vigor, efficiency, and endurance, affecting usually a large number of the nervous functions, and, on the other hand, by signs of active derangement, which in part seem to occur as positive symptoms, and in part are due to a failure of the mutual support and control which the different parts of the nervous system afford each other in health.

In its widest sense the term *neurasthenia* is used as covering the groups of symptoms usually indicated by such names as *nervous prostration*, *spinal irritation*, *neuropathic* or *neurotic diathesis*. Even abnormal mental states, such as mild degrees of melancholia and "morbid fears," are often classed as *neurasthenia*, but their relation to a more serious malady should not be forgotten.

Sometimes *neurasthenic* symptoms are secondary to localized pathological affections in one or another part of the body, and this fact has led some observers to recognize in *neurasthenia* only a symptom of errors of refraction, lithæmia, uterine disease, organic disease of the brain or cord, and the like. It would, however, be easy to push this attempt too far, and the writers certainly believe that *neurasthenia* is a useful term to indicate states of nervous weakness which are often primary, and which even when secondary usually imply a pre-existing basis of functional disease.

Since a sense of fatigue is generally one of the chief symptoms in the *neurasthenic* individual, it is possible that an actual pathological change in the nervous system is the cause of this condition. Hodge has shown that fatigued animals show degenerative changes in the protoplasm and nuclei of their ganglion cells, and some such process may be the underlying cause of certain types of *neurasthenia*. On the other hand, the tired feeling may be a purely psychological symptom or the result of an inharmonious working of a brain of which the several parts may be structurally normal.

It has been said with some truth that hysterical and hypochondriacal persons are always *neurasthenic*, but that *neurasthenic* persons are not always hysterical or hypochondriacal; and hysteria has also been spoken of as "nervousness" crystallized into the form of a definite disease. Although typical cases of *neurasthenia* and of hysteria differ widely, yet the two affections run into each other, and the same patient may, at the same moment or at different periods, show symptoms of both diseases.

While it is true that *neurasthenia* should be looked upon—relatively to hysteria and insanity—less as a distinct disease than as a departure from health, and as an expression of the mode in which degeneration of the nervous powers first shows itself, still it must not be forgotten that *neurasthenics* present certain symptoms which are almost as characteristic as those of any other of the neuroses.

SYMPTOMATOLOGY.—The symptoms called *neurasthenic* are conveniently divided into those which arise as a sign that the patient is unequal to the ordinary tasks of a fairly healthy person, and those which are manifestations

of a morbid action on the part of the nervous system over and above the indications of simple inefficiency. These can be called, for convenience' sake, *negative* and *positive* symptoms, respectively. Thus, the *negative* symptoms are those of fatigue or pain arising without sufficient cause, but still due to effort, and, within certain limits, proportionate to the effort made; while the *positive* symptoms are nervous outbreaks or signs of excessive weakness of special kinds, occurring almost independently of effort, and at least out of proportion to it. The negative and positive symptoms may run into each other, as, for example, when, in the place of an oversensitiveness or self-distrust, we find an ever-present sense of anxiety or "morbid fear"; or, when a simple incapacity of the eyes to bear a prolonged strain passes into a high degree of photophobia or asthenopia; or when instead of a simple feebleness of the digestion we have an active nervous dyspepsia, and so on through the whole range of nervous functions. Usually the symptoms of special nervous derangement appear on a background of general nervous weakness. It sometimes happens, however, that some one symptom is so prominent that it seems to stand almost alone. In like manner some cases present almost exclusively mental symptoms, and cannot bear a slight emotional strain without great suffering and yet may show more than ordinary physical strength and endurance; while with others by far the most prominent symptoms affect the muscular and vegetative functions.

The late Dr. George M. Beard, to whom we owe many valuable observations on this subject, attempted to base upon this fact a division of *neurasthenic* symptoms into cerebral and spinal, but this is premature and is not based upon sufficiently well-grounded reasoning.

Individual cases of *neurasthenia* vary so greatly in the grouping of their symptoms that it will be better to study the symptoms themselves case by case rather than to attempt to describe different types of the disease. It is, however, worth while to bear in mind that the term "irritable weakness" aptly indicates the character of many of the conditions met with.

Special Symptomatology.—The temperament of *neurasthenics* is essentially mobile. They are usually quick, versatile, and sensitive, and may be talented and intellectual, though they rarely have the robustness and endurance necessary for great success. Often a sense of nervous weakness and effort is present, which gives rise to self-consciousness and self-distrust, and finally to a suspiciousness toward others, and to a vague feeling of isolation and dread.

A healthy organism should respond to calls upon it with an elasticity like that with which the cushion of a billiard-table responds to the blow of the ball.

With *neurasthenic* patients this is usually not the case. A trifling impression arouses an exaggerated *inward reaction* in the form of egotistic or self-distrustful ideas, while the *outward reaction* is correspondingly feeble or unduly delayed. Slight obstacles seem mountains, and some patients can hardly persuade themselves into a decision or an exertion, although under the influence of some slight excitement they may act with energy and intelligence. A similar undue inward reaction is shown in other departments of nervous energy besides the strictly mental. Thus, even with patients who seem well-balanced and of good self-control, trifling causes may excite or maintain neuralgia or dyspepsia, disorders of the sleep, collapse of strength and the like, with provoking and inexplicable readiness.

Instead of the vague sense of anxiety and dread, special "morbid fears" are often present. The variety of these fears is endless. Among the most common is the fear of large open spaces, fear of crowds, of walking alone, or riding in railway trains, fear of contamination from touch, fear of taking food and the like, fear of becoming insane.

In many cases, of course, these symptoms mean something more serious than *neurasthenia*; but often, on the other hand, they represent the natural or "reasonable"