

that the erratic movements are due to organic change in the brain and spinal cord. That these have been benefited or cured by massage is strong proof of its far-reaching and powerful influence, extending from periphery to centre. Rest, massage, and abundance of easily digested food have proved successful in the early or acute stage; and in the decline of the malady, when slight irregular movements still linger, massage, exercise, and calisthenics have done well. In 1847 Laisné, of Paris, treated one hundred and eight cases of chorea by means of massage with almost invariably good results. Drs. Goodhart and Phillips, of London, have treated a number of acute cases of chorea by massage, suitable nourishment, and rest, and the advantages proved to be that when the massage was carefully performed, flabby and thin muscles became plump and firm. Marked improvement was observed in every case in the rapid subsidence of all the more violent movements; in improved circulation and warmth of the extremities; in the pulse becoming more regular; in the patients sleeping soundly after the massage; and in their decided increase in weight. The massage was given for fifteen minutes, twice daily.

**Neuralgia and Neuritis.**—In neuralgias of mild form, and in what seem to be the incipient stages of more severe attacks, as well as in old cases, in which every other remedial measure has been tried in vain, massage often yields favorable results. Used between the paroxysms of severe neuralgic pains, it generally lengthens the intervals between these attacks and lessens their severity. Pain arising from disturbance in the central nervous system is frequently relieved by massage. In cases of peripheral neuralgia when the affected nerves can be reached, massage may be expected to produce still better results. In well-marked degeneration of nerves, and when pain is dependent upon mechanical pressure that cannot be removed, we should naturally not expect any result.

The late Dr. Symons Eccles, of London, has treated successfully a number of cases of acute sciatic neuritis occurring in previously healthy people by means of massage, position, and rest. The massage consisted of effleurage, kneading, and percussion, and in the intervals the leg was suspended in a Salter swing, as this was the only position that afforded rest. Prof. Max Schuller, of Berlin, prefers massage to any other means in the treatment of sciatica. Of fifteen cases that were dealt with from the first by massage, he found that the severe pains soon abated, becoming less even after a severe and painful massage. When they recurred they were less severe, and gradually they disappeared altogether. It required eighteen days on an average for cure. We seldom hear of massage being tried in acute neuritis in the United States.

**AFFECTIONS OF THE CENTRAL NERVOUS SYSTEM.**—When paralysis of central origin has come on suddenly, I prefer to abstain from the use of massage until the perturbation in general has subsided and the patient has become somewhat accustomed to his unnatural condition. But in the mean time, while we are thus waiting to spare the nerve centres any supposed extra commotion, the peripheral pathological changes are gaining ground. These are: interference with the supply and return of the circulation owing to the accelerating influences of muscular contraction and relaxation being absent or diminished; and, as a result of this, variations of temperature, and passive hyperemia and ischemia; hypertrophy of interstitial connective tissue, with subsequent cicatricial retraction, giving rise to contractures and atrophy of muscular fibres; formation of adipose tissue and fatty degeneration; in a word, vaso-motor and trophic disturbances. These are all rational indications for the use of massage, either as a preventive of such changes or as a palliative of them when they have occurred. But if the nerve centres are impaired beyond recovery, or secondary pathological changes have already taken place, the prospect of recovery cannot be encouraging. My own experience with massage in a number of cases of paralysis may be briefly stated by saying that in the absence of severe pain, obstinate contracture, or tonic

spasm this agent has proved useful in improving the circulation, temperature, and comfort of the parts affected. When, in paralysis of spinal or cerebral origin, recovery has followed under manipulation, I have always hitherto assumed that the central disturbance had entirely passed away and that the force of habit was the main factor in perpetuating the external manifestations of inaction. But the more recent experiences and opinions of Dr. Zabudowski, professor of massage at the University of Berlin, and of others well qualified to judge, teach us that it is possible by means of massage and gymnastics to educate other parts of the brain and spinal cord, by arousing psychomotor impulses in the formation of new associations and combinations, to take the place of the injured ones. It therefore seems no longer necessary to regard paralysis, of either central or peripheral origin, from the hopeless point of view that we formerly did.

However that may be, when the causative conditions have ceased, paralyzed muscles will not at once resume their former natural condition. Massage, passive and resistive movements, restore them to a sense of existence, enable them to recognize the power they still possess, and educate this to a higher degree, and at the same time such treatment affords the only means of judging of the capabilities of the patient and of telling him how to use them. Sometimes the patient will make better motion against resistance than without it. This seems to give a sense of support and consciousness of power. Interlocking the fingers of one hand with the other, so that the well arm can raise the paralyzed one, is a most excellent device, encourages the patient, and educates the unimpaired centres to supplement the deficiency of the injured ones.

**Dry Symmetrical Gangrene.**—This peculiar malady was first described by Maurice Raynaud, a medical student in Paris in 1862. Observations since then have confirmed his description of this disease, the theory of which is that it is a neurosis characterized by great exaggeration of the excito-motor energy of the parts of the spinal cord that control vaso-motor innervation.—The posterior and lateral gray substance, according to Oppenheim.

If space permitted, cases of my own and of other practitioners might be narrated (see "International Clinics," vol. iv., 1901) which would justify the following conclusions:

1. When massage is of benefit in Raynaud's disease, it shows its effects very quickly.
2. These effects are improvement of the circulation and an increased suppleness of the parts, with a corresponding increase of the sense of warmth and comfort.
3. Massage is competent not only to maintain and improve the vitality of the tissues, but it may even effect a complete restoration after destruction of tissue has begun.
4. As the beneficial effects of massage in Raynaud's disease are of a permanent character, this procedure must act not only upon the vaso-motor nerves of the affected parts, but also upon their central connections in the brain and spinal cord.

**Sprains, Fractures, Displaced Semilunar Cartilages.**—When massage is employed sprains of all degrees of severity get well in one-third of the time ordinarily required in cases of this nature. The sooner after the injury massage is begun the speedier is the recovery. Friction and manipulation should be used above and below the injured joint, which should be gradually approached in this manner, and finally worked upon at the same sitting. Fractures unite more quickly when the limb is massaged from the first. The immediate advantages are reduction of swelling, pain, and spasm; the remote are less weakness, pain, and stiffness after the bones have united.

Sprains of the knee are sometimes accompanied by derangement of its internal structures, known as displacement of the semilunar cartilages of the knee-joint. If space permitted I could recite cases (see *American Journal of the Medical Sciences*, March, 1896) which have occurred either in my own practice or in that of others, which would seem to justify the following conclusions:

That it is possible by carefully applied massage, resistive movements, home exercises, and electricity so to strengthen the muscles on the front of the thigh, the fascia, ligaments, and attachments of the knee-joint, that they will safely hold a previously dislocated semilunar cartilage without artificial support.

These conclusions do not apply to cases which require surgical operations, although the above-mentioned combination of therapeutic procedures might be safely tried in some cases before cutting into a knee-joint. The adoption of massage, however, is more especially called for after the operation, its purpose being to restore motion and strength.

Douglas Graham.

**MASSANETA SPRINGS.**—Rockingham County, Virginia.

**POST-OFFICE.**—Harrisburg. Hotel and cottages.  
**ACCESS.**—Via Baltimore and Ohio Railroad to Harrisburg, thence a drive of four and one-half miles southeast to the springs. This resort is located in the Shenandoah Valley, near the Massametten Mountain, at an elevation of 1,350 feet above the sea-level. The waters of the springs have been in use for upward of fifty years, and are still extensively resorted to in the treatment of a variety of affections. They have been analyzed by Professor Mallet, of the University of Virginia, with the following results:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Calcium carbonate	12.10
Magnesium carbonate	5.73
Iron carbonate	3.12
Manganese carbonate	.43
Sodium carbonate	.93
Lithium carbonate	Trace.
Ammonium chloride	.13
Potassium chloride	.09
Potassium sulphate	.13
Calcium sulphate	.35
Alumina	.13
Arsenious oxide (in salt)	Trace.
Phosphoric acid	Trace.
Silica	.94
Organic matter	.40
Total	24.40
Carbonic acid united to carbonates as above to form acid salts.	
8.80 grains.	
Temperature of water, 55.7° F.	

These waters are said to be valuable in the treatment of chronic malarial poisoning, and the managers present numerous testimonials from physicians and others attesting their virtues. It is reasonable to believe, however, that the good effects observed have been in a large measure due to the excellent climatic and sanitary conditions about the springs. The water is an excellent chalybeate tonic, and also has diuretic properties. It is used commercially.

James K. Crook.

**MASSASOIT SPRING.**—Hampden County, Massachusetts.

**POST-OFFICE.**—Springfield. Restaurant at spring.  
**ACCESS.**—Trolley cars from Springfield run within two miles of the spring. The New York, New Haven and Hartford Railroad is within three-quarters of a mile, and the Boston and Albany Railroad tracks are about two miles away. The spring is charmingly located at a point about seven miles from Springfield, in a picturesque glen known as the "Bear Hole." It bubbles from the side of a bluff about 70 feet in height and at an elevation of about 250 feet above the level of the sea. The spring furnishes about 7,500 gallons of water per hour, having a uniform temperature of about 45° F. the year round. With the exception of a restaurant no buildings have been erected for the accommodation of guests, who consist largely of visitors from Springfield, Westfield, Holyoke, Chicopee, and other points during the summer months. The water has been analyzed by Prof. Charles Mayer, chemist, with the following result:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Sodium chloride	0.36
Lime carbonate	1.38
Magnesium carbonate	.48
Lime sulphate	.35
Silica	.24
Organic substances	.72
Total	3.43

Traces of potash, iron, alumina, phosphates, nitrates.

The water is remarkably free from micro-organisms and ammonia, and contains only a slight trace of nitrates. It closely resembles the waters of the Poland Spring in Maine. It meets all the requirements of a wholesome table water. It is said to be a great aid to feeble digestion and to assist in overcoming obstinate constipation. The water has an extensive sale, and no doubt in time a resort will be established at the spring.

James K. Crook.

**MASSENA OR ST. REGIS SPRINGS.**—St. Lawrence County, New York.

**POST-OFFICE.**—Massena Springs. Hotel.  
**ACCESS.**—Via Rochester division of the Rome, Watertown and Ogdensburg Railroad, or via Massena Springs branch of Grand Trunk Railroad to Massena Springs Station.

This is one of the old-time resorts of the Empire State. The springs are delightfully situated on the banks of the Raquette River, a broad and rapid stream flowing into the St. Lawrence. The following analysis was made as long ago as 1850 by Prof. W. J. Crow:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Calcium bicarbonate	4.85
Iron bicarbonate	.49
Sodium hyposulphide	4.21
Sodium sulphate	.50
Calcium sulphate	60.00
Sodium phosphate	1.32
Sodium chloride	76.79
Potassium chloride	.51
Magnesium chloride	29.93
Magnesium bromide	.67
Sodium sulphide	1.40
Organic matter	11.18
Silicate of soda	
Total	191.88

Sulphureted hydrogen gas, 5.30 cubic inches.

This analysis indicates that the water belongs to what may be termed the muriated-calcic-alkaline sulphureted variety, but for ordinary purposes the term saline-sulphureted is sufficient. The water resembles that of Eilsen, in the principality of Schaumburg-Lippe, but is much richer in chloride of sodium. It has been found decidedly useful in dartsous forms of skin disease, in renal and vesical calculus, in catarrh of the bladder, and in other affections. Bathing facilities are ample.

James K. Crook.

**MASTERWORT.** See *Umbelliferae*.

**MASTIC.**—MASTICHE. "A concrete resinous exudation from *Pistacia Lentiscus* L. (fam. *Anacardiaceae*)" (U. S. P.). This is a graceful little tree with slender, brownish-gray branches, and evergreen pinnate leaves. Its flowers are very small, dioecious, in erect axillary spikes; its fruit consists of little, dry, red drupes, about as large as cubebs. Large resin canals exist just beneath the surface of the thin bark, from which a certain amount of turpentine exudes spontaneously. It is widely distributed through the Mediterranean region.

Mastic is a drug of venerable antiquity, being mentioned by the early Greek and Latin writers upon medicine and natural history two thousand years or so ago. It has been kept in use ever since, and several hundred years ago it entered into the formation of numerous medicines and plasters, and was highly prized. It is now fast becoming obsolete, so far as medicine is concerned.

It is collected in the northern part of Scio, whose political fate for centuries depended upon its importance, from cultivated (male) trees planted for the purpose, by making light incisions in the bark, through which it flows in little rounded tears, and on which it slowly hardens in the same shape. Two or three weeks after the tapping, the collectors revisit the trees and collect the little tears from the bark, and from the ground, to which some of them have fallen. This product is afterward sorted, according to whiteness, cleanness, and shape, into several grades, and so sold. The best of that which reaches us is in lemon-yellow tears, of the size of a large pea and smaller. The surface is smooth and free from dust, by which it is distinguished from the dusty tears of sandarac, and the fracture is clear and glassy. Odor and taste pleasantly terebinthinous; texture brittle, but softening in the mouth. Mastic contains one to two per cent. of essential oil, about ninety per cent. of resin, soluble in alcohol, and ten of another resin soluble in ether, but not in alcohol. Mastic is superior when fresh, and this is determined by its degree of plasticity when chewed and by its higher solubility (up to ninety per cent.) in benzol.

The medicinal action of mastic is exactly that of other turpentine, although, perhaps, on a slightly milder scale than the most active of them; that is, it is a local and renal stimulant. It has been, and still is, in the East, employed as a sort of dentifrice, and as a temporary filling for carious and aching teeth. Out of respect to old tradition it is still used in the *Pilula Aloes et Mastiches* of the Pharmacopœia, which are one-sixth mastic. It is claimed that the addition of the mastic increases the certainty and promptness of action of the aloes, as of other cathartics.

Oil of mastic, of a clear yellow color, having a specific gravity of 0.858 and the characteristic odor of mastic, is an article of commerce.

ALLIED PRODUCT.—*Pistache* or *Pistacia Nuts* are the seeds of *Pistacia vera* L., obtained chiefly from trees cultivated in the Mediterranean region. This product has no medicinal properties, but is extensively used as an article of food or flavoring by confectioners, in *bonbons* and ices. An emulsion may be made by pounding the seeds with sugar and water, after the manner employed with almonds. This can be used as a pleasant vehicle for more active substances.

Henry H. Rusby.

**MASTICATION.**—In order that the digestive juices may act rapidly and efficiently upon the solid food, it is necessary that a large surface should be exposed to their action; otherwise the time of digestion is lengthened and the large lumps of solid matter disturb digestion both by undergoing decomposition and by acting as mechanical irritants to the mucous surface which lines the alimentary canal. The necessary comminution is brought about in the process of mastication by the action of the jaws armed with their various types of teeth, and assisted by the muscular action of the buccinators and tongue.

In addition to being thoroughly subdivided by mastication, the food is intimately admixed with the saliva which is poured out upon it during the process, and so is converted into soft semi-fluid mass which can easily be swallowed. It has also been recently shown by Pawlow, that efficient mastication, in some reflex fashion, greatly promotes the secretion of gastric juice and so favors peptic digestion. For the quantity of gastric juice secreted is not nearly so great when food is introduced into the stomach through a gastric fistula as when in the same animal it is chewed and swallowed in the natural fashion. Further, in an animal with both an œsophageal and a gastric fistula, in which the food drops out at the œsophagus, after being masticated and swallowed, so that none reaches the stomach, it is found that mastication produces a copious flow of gastric juice.

For these reasons it is obvious that efficient mastication is a great adjunct to the process of digestion, and, although for a time the digestive juices may be able to digest the solid food, even when mastication is defective and the food is swallowed in lumps, yet such a defect in

the preparation of the food handicaps the forces of digestion and paves the way for commencing a vicious condition of affairs which may go from bad to worse unless the mastication of the food be improved.

The mouth and not the stomach is, therefore, the first ground which ought to be examined in cases of indigestion, and after that has been, from the mechanical point of view, set in as good order as under the existing circumstances is possible, then the habits of mastication ought to be investigated, and the vicious practice of eating in a hurry and bolting the food in a semi-masticated condition should be eradicated.

It is interesting to observe, as was first pointed out by Cuvier, that a constant relationship exists in different classes of animals between the nature of the food, the form of the teeth, and the articulation of the jaw. Thus, in typical carnivora the teeth are adapted for seizing and lacerating the food, there are no true grinding teeth, and accordingly there are no grinding movements of the lower jaw, which articulates by a simple hinge joint. In herbivora, on the other hand, the nature of the food is such that extensive pounding and grinding are required, and hence the lower jaw is so articulated as to allow of extensive sliding movements from side to side. In this connection, it may be stated that the articulation of the lower jaw in man, not less than his dental series and intermediate length of alimentary canal, demonstrates that he has developed as a mixed feeder capable of masticating both vegetable and animal food, and that a mixture of such foods is his natural provender.

The act of mastication is usually described as a voluntary one, but while this is true in the sense that our eating is under the control of our will, and that we can initiate and arrest the process by acts of volition, still it is well to point out that, like all complex co-ordinated muscular acts, the process is largely a reflex one guided from lower centres, chiefly by an adjusted co-operation of afferent and efferent nerves. Complicated co-ordinated actions of such a type are learned and laid down in the central nervous system in early infancy, and at a conscious age all their details are practically out of the control of the will, so that we walk, talk, and eat without consciously exerting the will over the details of these processes. This has a very practical bearing in regard to mastication, as it gives an explanation of the difficulty attending a reform of the acquired habit of hasty mastication. It is a simple thing to tell a patient who complains of indigestion not to bolt his food, but to eat it slowly, carefully masticating each mouthful, and, if necessary, counting so many before swallowing. But the process has become almost a reflex, and the patient finds the advice, even with all artificial aids, most difficult to carry out; he has to keep his thoughts chained upon the problem all the time he is eating, which to many persons is an impossible task, and so at intervals he unconsciously lapses into bolting his food. Again, when some relief has been obtained and urgency has hence been removed, he no longer can keep his mind at work regulating his eating, and once more the old habit or old reflex becomes established. The problem, in fact, is nearly as difficult as that of breathing at an artificial rate, or altering the depth of the respiratory movements.

The afferent nerve chiefly involved in mastication is the fifth, while the efferent or motor impulses travel by the motor root of the fifth to the elevators of the jaw and the mylohyoid, by the facial to the digastric and the muscles of the lips and cheek, and by the hypoglossal to the muscles of the tongue.

In considering the mechanism of the process of mastication, it must be remembered that the action of the cheek muscles and tongue in replacing the food between the teeth after each movement of the lower jaw is quite as essential as the jaw movements themselves, since otherwise the jaw movements would be entirely useless. This is demonstrated by the fact that in bilateral paralysis of the tongue, of either sensory or motor type, mastication becomes almost impossible, and also in paralysis of the buccinator muscle, accompanying facial paralysis, the

food accumulates in a pouch on the side of the flaccid buccinator, from which it must be removed from time to time by the pressure of the hand applied to the cheek.

The mechanism of action of the tongue and cheek muscles in mastication is carried out in the following manner: By each chewing action of the lower jaw, whether it be an upward movement closing the jaws or a grinding lateral movement, the food is subjected to pressure by the teeth from above downward and to muscular pressure produced on the inner margin by the tongue and on the outer margin by the buccinators. The jaw pressure is the more powerful of the two, and hence the portions of food lying immediately between the teeth, after being bruised, crushed, or divided, are thrust on each side into the regions of less pressure, that is to say, either between the tongue and palate or into the pouches of the cheeks. Then the lower jaw is dropped, and by the contraction of the buccinators on the one hand, and the pressure of the tongue toward the hard palate on the other, the food is restored again to its position between the teeth, in readiness for the next action of the teeth upon it.

The tongue is moved forward by the genioglossus and its transverse intrinsic fibres, and retracted by the hyo-, palato-, and styloglossi. Lateral movement is aided by contraction of the intrinsic longitudinal fibres.

The movements of the lower jaw may conveniently be described as consisting of two types, although any given movement of mastication usually is a complex of the two types, co-ordinated or combined with each other in varying proportion. Movement at the condyles may either be effected as at a simple hinge joint, giving as a result merely an up-and-down movement of the lower jaw such as occurs in speaking; or the condyles may be moved backward or forward on the interarticular cartilages, so causing a gliding movement of the lower jaw. Moreover, in the second type of movement, the extent of movement may be different at each condyle or even performed in an opposite direction, namely, forward at one condyle and backward at the other, so giving rise not to simple backward or forward gliding movements but to combinations of these with lateral gliding movements. It is this kind of movement by which the grinding action of the molar teeth is brought about, and it is hence seen typically in ruminants; while the simple up-and-down action is seen in the "biting off" action of the incisors, and piercing action of the canines; this is hence the typical action of the carnivorous jaw.

The share taken by the various muscles in bringing about these movements may be apportioned in the following manner; but it must always be remembered that any movement is in most cases a resultant of the action of nearly all these muscles called forth in varying degree, in some cases in the direction of increased tonicity or contraction, and in other cases of diminished tonicity or relaxation: The lower jaw is raised by the action of the temporal, masseter, and internal pterygoid muscles; it is lowered, chiefly passively, by the action of gravity, but this is probably normally aided by the contraction of the anterior belly of the digastric, and in forced depression also by the mylo- and geniohyoid muscles. Forward movements are effected most powerfully by both pterygoids acting in concert, while if these muscles act on one side only, that side is drawn forward round the opposite condyle as an axis, thus causing lateral movement toward the opposite side. The external pterygoid possesses only this lateral action, and acting alone can, from the direction of its fibres, neither raise nor lower the jaw; but, as stated above, a certain component of the force of the internal pterygoid acts as an elevator of the jaw.

The posterior position of the jaws, in which the lower incisors lie behind the upper, and the condyle of the jaw rests in the glenoid cavity, is the natural one of stable equilibrium toward which it returns on account of the elasticity of its attachments when the pterygoids cease to pull upon it; but the posterior fibres of the temporal and masseter muscles tend to draw it backward. The anterior

fibres of the masseters, in addition to their main action of elevating the jaw, have also a small forward component.

Benjamin Moore.

**MASTOID OPERATIONS.**—INDICATIONS FOR OPENING THE MASTOID CELLS.—There is no single symptom, local or general, which, considered by itself, will lead the surgeon to say positively that the mastoid cells ought to be subjected to a direct investigation. The decision to take this step will have to be reached by a careful consideration not only of the history of the case and of the actual conditions revealed by the ordinary examination of the ear and its surroundings, but also of the kinds of microorganisms found by the bacteriologist in the discharge that escapes from the middle ear. If the services of the latter were more often called into requisition by the surgeon, to aid him in determining whether or not he should open into the mastoid process, it is highly probable that operative interference would be resorted to earlier and with greater confidence, as well as in a much larger number of instances, than is now the case. In corroboration of this statement I have only to say that the knowledge that the specially virulent streptococcus, and not the staphylococcus or the pneumococcus, is the infective agent, in any given case of suspected mastoid involvement, will remove from the minds of most surgeons any remaining doubts in regard to the wisdom of resorting to an operation. The most constant and the most indicative symptom of the purulent involvement of the mastoid process is a *very profuse and creamy discharge of pus* from the middle ear associated with a *protrusion of the posterior and superior cutaneous wall of the external auditory canal near the drum membrane*. But there may be serious involvement of the mastoid cells even when these associated symptoms are entirely absent. Thus, for example, I have seen at least two cases in each of which the discharge had stopped for a period of between two and three weeks, the perforation had healed, and the drum membrane presented a practically normal appearance; and yet in each of these cases the mastoid portion of the temporal bone was found to be extensively diseased. In one of the patients there was neither pain in the region of the ear nor tenderness on pressure over the mastoid process. Nevertheless, pus had accumulated beneath the mastoid perosteum, the pulse was increased in frequency, and there were occasional elevations of temperature. In the second case referred to above, marked mastoid tenderness was present. An operation was performed in both instances and it was found that in each case the mastoid cells were filled with pus, and that, in addition, large extradural abscesses were present—the abscess, in one case, extending beyond the occipito-mastoid suture.

A very frequent and very prominent symptom is *tenderness on pressure* over a whole or a part of the mastoid process. The tip is the most frequent site of this tenderness and the area over the antrum comes next. When the tenderness is most marked back of the mastoid tip it is very likely that we are dealing with a case of perisinous abscess. Another point where mastoid tenderness is to be detected is upon the posterior surface of the wall of the external auditory canal. If the case is a recent one this tenderness on pressure may not be very significant; but if it persists, especially after the use of the ice coil for thirty-six hours, then it is time for the surgeon to invade the mastoid cells. The difficulty is, that this symptom is frequently absent even in a case of well-marked mastoiditis. A differentiation will have to be made between tenderness on pressure due to mastoiditis and tenderness due to a furunculosis of the external auditory canal. The history of the case will be of service in reaching a conclusion. If mastoiditis is present, there will generally be a history of pain followed by a discharge; the active pain then ceasing. Then besides, as the canal is generally found to be sufficiently open for the observer to obtain a view of the drum membrane, he will be able to see the pus oozing through a perforation. On the other hand, in a case of furunculosis of the external auditory canal the pain does not diminish but rather