outward. Large transverse ridges are often found on the sternum; also a hollow or depression may be seen at the upper part, due to the manubrium not enlarging relatively as much as the body of the sternum.

The costal cartilages are large and more or less ossified, and often show prominent cartilaginous or bony nodes at their points of junction with the ribs, thus simulating the rachitic rosary. The ribs are wide and thick, and by the faster growth of the costal cartilages they become abnormally oblique, while the sternum itself is pushed forward, giving an enormous antero-posterior diameter to the chest.

Upper Extremity.—The clavicles are always found enlarged, often enormously so, most marked at their extremities, and especially at their sternal ends. Their ridges and tubercles are very prominent.

The scapulæ are generally found enlarged, especially in their transverse diameters, and the spines may be enormous in size. The glenoid articular surfaces are often enlarged, through the ossification of the glenoid ligaments.

The articular surfaces of all of the long bones are enlarged, due to ossification of the articular cartilages or ligaments, and they are often roughened. There may be exostoses, spongy growths, osteophytes, or calcareous deposits in and around the joints.

The humerus is frequently not enlarged, though its extremities, especially the head, may be.

The radius and ulna, if the case is of long standing, are found enlarged, especially at their articular surfaces, and more especially at their lower extremities. As previously stated, the ridges and protuberances of all the bones are enlarged and prominent.

The carpal bones are probably always more or less enlarged, and may all be very markedly so. The metacarpal bones and phalanges are widened and thickened; the former especially at their heads, and the latter at each extremity, thus rendering the joints prominent. The distal phalanges are generally the most affected, and may show an increase of spongy tissue at their ungual ends.

Pelvis.—The pelvis is always enlarged, with the symphysis of the pubic bones often wide and deep, while the crests of the ilia are wide apart, by reason of a spreading out of the ilia. Though the pubic bones and the iliac bones may be enlarged, with their ridges and eminences increased in size, and with the obturator foramina enlarged, the substance of the bones themselves may be considerably thinner than normal. The acetabular cavities are often enlarged and roughened by partial ossification of the cotyloid ligaments.

Lower Extremity.—The femurs may be enlarged at both extremities, as may also be the heads of the tibiæ and fibulæ.

The patellæ are often enlarged and may present abnormal spinous processes.

The malleoli are frequently found enlarged. All of the tarsal bones may be enlarged; especially is the os calcis often enormous in size, on account of the laying on of bone at the attachment of the tendo Achillis.

The metatarsal bones and the phalanges of the toes are all enlarged similarly to the hands. Thompson found several of the phalanges of the toes ossified together. The distal phalanges may show spongy enlargements at both extremities, and there may be spongy spiculæ of bone which reach around from one extremity to the other, forming foramina or incomplete notches on the sides of the bones.

ETIOLOGY.—The question as to the cause of this disease is a very important and interesting one, and various theories have been advanced.

Freund suggested the probability that acromegaly was a disease of puberty, *i.e.*, a disease of development, a possible returning to type, the large hands and feet, projecting jaw, and retreating forehead being certainly very suggestive. He said that this anomaly of development had some relation to the condition of the developmental organs, to sexual development, and that the early cessation of menstruation or early loss of sexual power caused acromegaly.

This theory is not supported by facts. In the first place, two-thirds of all cases develop after the age of twenty; and while the cessation of menstruation is unquestionably an early and a very frequent symptom, it is not constant, and is only a symptom, and the loss of sexual power in the male is a gradual loss, diminishing with the progress of the disease. I believe these phenomena are only symptoms, and I cannot attribute to them, as does Freund, a causative relation to this disease.

Sex does not seem to bear any special relation to the disease, though the records show a few more men to have been attacked than women. Nativity plays no important part in the causation of acromegaly, and probably no race is exempt. Heredity does not seem to be a tangible factor, and no foregoing disease or condition is known to predispose or to cause acromegaly.

The Klebs theory that the disease is due to angiomatosis, and that its seat is in the vascular system, though having its supporters, I believe not to be founded on fact. That there is thickening of the walls of most of the blood-vessels and that there is a thinning of the walls of some blood-vessels, giving rise to hemorrhages and varicose veins, there is no question. Also that there is a vasomotor ataxia is unquestionable. It is a fact, furthermore, that we have enlargement of some of the blood-vessels supplying hypertrophied tissue; but that there is an actual new growth of blood-vessels in this disease is, I believe, not true.

The theory of Von Recklinghausen, that this disease is of neurotic origin, is, I believe, incorrect. Lancereaux believes it to be a trophoneurosis. That we have nearly all kinds of neuroses and vasomotor and trophic disturbances is true, but that the origin is not in the nervous system but in the ductless gland system, I am firmly convinced.

The thyroid and thymus glands have come in for their share of interest as being the supposed cause of this disease.

While I do not believe that puberty or disturbed conditions of the genital system have anything to do with causing this disease, still I believe that Freund struck the keynote when he claimed that acromegaly was a disease of development. The majority of cases can be traced as beginning in the decade of life between twenty and thirty years.

In the beginning this disease is closely allied to gigantism, and I believe a disturbed condition of the pituitary body to be the cause of both conditions. I believe that gigantism in its perfect development to be due to a normal hypertrophy of the pituitary gland, *i.e.*, a hypersecretion occurring at the age of puberty or age of general and symmetrical body growth and development. I believe that in its incipiency the disease of acromegaly is primarily a hypertrophy of the pituitary body, causing a condition of beginning gigantism. Earlier in some cases, later in others, this normal hypertrophy of this gland becomes a pathological condition—either a new-growth formation, or a cyst formation, or both. At this time the symptoms of acromegaly due to disordered secretion from the pituitary will begin to appear and will grow more typical the longer the patient lives.

I believe that gigantism will remain such as long as the pituitary body is in normal hypertrophy, but that these cases of gigantism will assume later an acromegalic type, if, as is often the case, the pituitary body begins to take on pathological conditions. In other words, I believe that an excess of normal secretion from the pituitary gland is the cause of gigantism, while perverted secretion from it is the cause of acromegaly.

When the pituitary body becomes diseased in these acromegalic cases it seems that very frequently, perhaps almost invariably, the thyroid gland becomes enlarged and attempts to do some of the work which the pituitary is now unable to do. If the thyroid is much enlarged we have added to the condition of true acromegaly the conditions present in exophthalmic goitre, namely, exophthalmos, irregular nervous heart, profuse sweating, etc. If the thyroid—and it is this gland which most frequently attempts to assist the pituitary body in its lost function—becomes atrophied or degenerated and does not furnish its normal secretion, we have a greater amount of hypertrophy of the soft tissues, that is a myxœdematous condition added to the condition of true acromegaly. Just what relation a persistent thymus gland (if the cases of reported persistent thymus glands be thymus glands and not thoracic thyroids) bears to the thyroid gland we are not yet able to state.

My own case proves that an auxiliary thoracic thyroid containing a large amount of physiological iodine can develop sufficiently to assist an incompetent thyroid gland.

To sum up my interpretation of the causes of the conditions present in acromegaly:

1. I believe the primary cause of acromegaly to be due entirely and alone to a disordered secretion of the pituitary, this disordered secretion either allowing or promoting a general connective-tissue increase all over the body, and an irregular normal hypertrophy and body growth; in other words, this gland normally has a secretion or elaboration which has something to do with the growth of the body.

2. Next, we find the thyroid attempting to furnish some new secretion, and at the same time a large amount of its own, to assist the pituitary body. Its hypertrophy, however, soon becomes pathological by connective-tissue formation, and the gland does not furnish proper thyroid secretion. We now have symptoms of partial myxœdema with enormous hypertrophy of the soft parts, especially over certain portions of the extremities, and from an enlarged thyroid we may have pressure symptoms and exophthalmos.

3. All of the other symptoms of acromegaly are due to the pressure of the enlarged pituitary, or to connective-tissue growths in the organs of the body, or to growth of the bones.

DIAGNOSIS.—This disease must be diagnosed from myxœdema, gigantism, erythromelalgia, elephantiasis, leontiasis ossea, chronic rheumatism, syringomyelia, rachitis, osteitis deformans, arthritis deformans, pulmonary hypertrophic osteo-arthropathy, local hypertrophies, and adiposis dolorosa.

More than one case of acromegaly has been described under the name of *myxœdema*. Myxœdema is an affection associated with an increase of the subcutaneous fat and connective tissue, and is characterized by a mucoid deposit in the skin. There is swelling of all parts of the face, tongue, throat, and larynx, but generally there is no pitting. The hands become large and clumsy, and there may be pain in the joints and head. There may be loss of hearing, choked disc, and impaired mental faculties, even to dementia in the last stages.

The principal clinical differences between these two diseases are as follows:

Myxœdema.	*Acromegaly.*
1. About eighty per cent. of all cases are women.	1. Both sexes are about equally affected.
2. Occurs most frequently between the ages of forty and fifty.	2. Begins most frequently between the ages of twenty and forty.
3. Bones are never enlarged.	3. Bones are always enlarged.
4. Face is round and full.	4. Face is oval or elliptical.
5. The ends of the fingers are swollen and clubbed.	5. The ends of the fingers are of the same size as the bases, *i.e.*, they are "sausage-shaped."
6. The skin is pale, waxy, puffy, boggy, and shiny.	6. The skin is yellowish, wrinkled, and hairy.

Gigantism, or giant growth, is distinguished from acromegaly by the fact that in the former there is symmetrical and general growth all over the body; the cranium grows as much as the facial bones, and the face does not look too large for the head, nor the head too large for the body, as is the case in acromegaly.

In gigantism the ends of the bones are not enlarged out of proportion to the size of the shaft, and the hands and feet are not enlarged out of proportion to the arms and legs. The bones increase in length as well as in width and thickness, and that symmetrically, and the whole growth of the body is in proportion, as in a normal individual, all of which is quite the contrary of what is observed in acromegaly.

In gigantism there is no projection of the lower jaw, there are no nervous phenomena, there are no eye and ear symptoms. The nose, ears, lips, and tongue are not increased in size out of proportion to the size of the head, face, and mouth.

In *erythromelalgia*, a vasomotor neurosis of the extremities, there may be some increase in the size of the hands and feet with severe pain, and there is always an impaired blood flow, giving burning sensations, local redness, and even cyanosis, often in patches or spots. Cênas' case, with its peculiar pigmentation, is the only case of acromegaly that has markedly simulated erythromelalgia. In the latter disease, however, there is no enlargement of the bones or soft parts of the face, no eye symptoms, no marked change in the speech, and the hand itself is unlike the acromegalic hand; the fingers are not sausage-shaped, but smaller at the tip than at the base.

Elephantiasis Arabum is a hypertrophic disease of the skin and subcutaneous tissue, located generally in one, occasionally in two extremities of the body. There is generally a history of several attacks of local inflammation of the part affected, followed by a continuous growth and hypertrophy of the skin, until an enormous size is reached. The hypertrophied skin falls in great folds, fissures form, and the part becomes one immense, homogeneous mass, without form or shape, and sections show a fibrous tissue without nerves or blood-vessels.

How different is this picture from that of acromegaly, where all of the extremities are enlarged, or at least one after the other, and the parts never lose the normal curves, prominences, and hollows, and, though large, preserve their normal contours.

Again, in elephantiasis the bones are not enlarged, the skeleton is not affected, and the nervous, facial, and cerebral phenomena of acromegaly are not present.

Leontiasis ossea is the name given by Virchow to the condition in which osteophytes, or bony tumors, are formed on the face and cranium. These bony tumors are of irregular distribution, and produce great deformity and asymmetry. There is no hypertrophy of the limbs. Though this disease has been several times mentioned in the diagnosis of acromegaly, I fail to see how it could be confounded with the general constitutional disease of acromegaly with its manifold signs and symptoms.

During the first stages of acromegaly one of the frequent symptoms, and often a prominent one, is joint pain, which at this stage might lead one to mistake the disease for *chronic rheumatism*. The joints at this time are tender to the touch, but are not reddened or swollen. The pain is not permanent in any one or two joints, and ankylosis does not take place, although later crepitations are often present, and some contractures of the fingers may be found, as in Cênas' case, due to the flexor tendons not growing as rapidly as the bones. As soon as the hands, feet, or face begin to enlarge, the diagnosis from chronic rheumatism becomes plain.

Syringomyelia is a disease of the nervous system which generally begins before twenty, or in early adult life, and in its slow development and long duration simulates acromegaly. After the complete development of either disease, however, "the amyotrophic paralysis, with retention of tactile and loss of thermic and painful sensation" (Osler) in the case of the syringomyelia, and the enlarged extremities, the formation of the face and chest, to say nothing of the signs of pituitary enlargement, in the case of the acromegaly, render the diagnosis easy. Several cases of acromegaly have shown coincident symptoms of syringomyelia, and autopsical examinations have revealed gliomata in the spinal cord.

Rachitis is a disease of childhood, or rather babyhood, occurring most frequently in children under three years of age. This alone would exclude the possibility of con-

fusion with acromegaly, except in congenital cases. Rickets is pre-eminently a disease of impaired bone formation, as manifested by the slow eruption or entire absence of the teeth and by the impaired growth or softening of the bones; while acromegaly, on the other hand, is pre-eminently a disease of increased bone formation.

The ends of the bones, especially the epiphyses of the wrist, unquestionably are enlarged in rickets, while the hands and feet may be flattened and apparently widened, but there is no increase in the thickness of the hands or feet. The bones of the head show no malformation, except flattening and lengthening of the cranium with projection of the occiput and the softened spots. This causes the cranium in rickets to appear too large for the face, while in acromegaly the face appears too large for the cranium.

Also in rickets we find deformities of the pelvis, and if the child creeps, deformities of the arm bones, and if he walks, bending of the leg bones. This is quite different from acromegaly, in which we have widening, hardening, and general growth of the bones. Softening of the ribs causes a sinking in just before the junction with the cartilages, giving the formation of the rachitic rosary, which from another cause we also find in acromegaly. Kyphosis, when it occurs in rachitis, is in the dorsal region, while in acromegaly it is almost invariably in the cervico-dorsal region. It is thus seen that it is hardly possible to confound the one disease with the other.

The diagnosis between the *osteitis deformans* of Paget and acromegaly is generally not difficult.

The following schedule shows some of the marked differences:

Osteitis Deformans.	*Acromegaly.*
1. Rarely occurs before fifty, never before forty years of age.	1. Very generally begins before forty years of age, almost never after fifty.
2. The long bones are the ones primarily affected; rarely are the hands or feet affected.	2. The hands and feet are enormous; long bones are generally not much affected.
3. The long bones are often curved, giving great deformity.	3. The long bones are normal in shape, possibly thickened at the extremities, but are never curved.
4. Often one limb or one bone is affected long before another limb or bone.	4. The hands, feet, arms, and legs are generally nearly symmetrical.
5. The cranial bones are affected, rarely the facial.	5. The facial bones are affected, rarely the cranial.
6. The lower part of the face is narrow, giving it a triangular appearance.	6. The lower part of the face is broad, giving it an elliptical appearance.

The above gross differences, to say nothing of the more minute ones, will generally render easy the diagnosis of osteitis deformans from acromegaly.

Arthritis deformans, perhaps, approaches more nearly than any other bone disease to the external conditions found in acromegaly. In arthritis deformans decided changes take place in the articular tissues, and are accompanied by pain, with sooner or later great deformity and ankylosis of the joints. Tender nodules may appear in the muscles, while the muscles themselves become atrophied. The disease is apt to attack the same joints on both sides of the body symmetrically, but soon spreads to all of the joints. The hands are thin from the wasting of the fat and muscles, but the ends of the phalanges and metacarpal bones may be enlarged and nodular. The fingers are more or less flexed and turned toward the ulnar side of the arm, while the joints of the hand are all stiff and more or less completely ankylosed. How different is this condition from the acromegalic hand!

Within the joints bony or cartilaginous protuberances are found on the outer surface of the epiphyses in arthritis deformans, while in acromegaly we may find osteophytes at the ends of the bones, or bony growths in the joints. Aside from this similarity in the joint lesions these two diseases show no agreement of symptoms or appearances. The hypertrophy of the soft parts of the hands and face, with the enlargement of the bones of the face, with the cervico-dorsal kyphosis, enlarged tongue, changed voice, and signs of pituitary enlargement, will all or any of them render the diagnosis from arthritis deformans easy. Schulz has reported a case of acromegaly associated with arthritis deformans.

The condition known as *pulmonary hypertrophic osteo-arthropathy* must be carefully separated from acromegaly, as it simulates the latter disease by causing an enlargement of the hands and feet. This osteo-arthropathy is subsequent to, or consequent on, some affection of the lungs, which may be a bronchitis, an empyema, or perhaps most frequently some new growth located primarily or secondarily somewhere in the respiratory tract.

The hands are enlarged, but principally in the joints and the ends of the fingers, the middle of the hand not being attacked. The elbow, shoulder, and knee joints are all affected, and there is always more or less impaired motion. The wrist joint is large, the hand proper not much enlarged, while the fingers are increased in size, especially the last phalanx, but the soft parts are not hypertrophied. The appearance of the finger nails is also quite characteristic of this disease. They appear too large for the fingers, spreading out at the sides, and even curving over the ends of the fingers, often giving the appearance of the beak of a bird, while the enlarged ends of the fingers have caused them to be likened to "drumsticks." Turning to the acromegalic hand, with its immense thickening of the hand proper, hypertrophy of the soft parts, equally enlarged phalanges, sausage-shaped fingers, small nails, much too small for the fingers, one might make the diagnosis by the hand alone. The bones in pulmonary hypertrophic osteo-arthropathy are enlarged, but not the soft parts, while in acromegaly both are enlarged. In the former disease dorso-lumbar kyphosis may be present, while in acromegaly the kyphosis is cervico-dorsal.

The feet and toes in this disease are affected similarly to the hands. The face presents a different appearance from that of acromegaly; it is more rounded, the lower jaw is very rarely enlarged, prognathism does not occur, the face appears small, the soft parts are not hypertrophied, and the lips and tongue are normal in size.

Local hypertrophies are not instances of partial acromegaly. These local enlargements of one extremity, or one finger, or one toe are generally congenital, though they may increase in size at the time of puberty. One side of the face may be affected, involving the bones and soft parts, including the tongue, tonsil, and palate on that side, but whatever the enlargement there is no symmetry.

One more disease remains to be diagnosed from acromegaly, viz., *adiposis dolorosa*. This disease is characterized by an enormous deposit of fat, first in the form of nodules, either in one location or in corresponding places on the upper or lower extremities. These deposits soon cause pain, diminished sensibility, and muscular weakness, and the muscles may show the reaction of degeneration. The absence of any marked enlargement of the hands, feet, and face, as well as the absence of increased bone growth, excludes confusion with acromegaly.

Prognosis.—The duration of acromegaly is variously estimated from ten to twenty years. The patient may die of some intercurrent disease, or may live for years with but a slow progression of the disease, but no case of complete recovery has yet been reported.

This disease is one of continuous progression, especially in the growth of the bones. Under treatment, or without treatment, periods of apparent quiescence or periods of cessation of symptoms occur, and the soft parts of the hypertrophied portions of the body not only may not enlarge, but may actually appear to be diminished in size. Yet even in such cases the bones apparently continue to grow.

These periods, when the patient may say that he feels well, are sooner or later followed by marked exacerbations of all the symptoms, often coming on suddenly. These symptoms, all of which may be ameliorated by treatment, are severe headache, often dizziness, obstinate constipation, troublesome dyspepsia, aggravated eye or ear symptoms, great temporary loss of strength,

and melancholia, with more or less pain referred to various parts of the body. At this time the soft parts on the hypertrophied portions of the body appear larger, although œdema may not be found.

A more or less complete recovery from these exacerbations, or severe symptoms, generally occurs, but the patient is not quite as well in all respects as he was before. Thus the disease proceeds, with some symptoms more or less constant, until there is hardly a tissue or organ of the body that is not affected in greater or less degree.

Finally, little by little the patient falls into a condition of progressive cachexia, with partial or nearly complete loss of muscular power, due to atrophy of the muscles, so that he may be compelled to remain in bed. This condition may last for several years, and then death occurs unexpectedly and suddenly from syncope.

It is possible that an enlarged pituitary body may cause coma and death. Most cases of acromegaly, however, die of some intercurrent affection, the most frequent of which are cardiac disease, nephritis, or diabetes, all of which are the results of the connective-tissue hyperplasia of the involved organs, viz., heart, kidney, and pancreas respectively.

The headache and cerebral disturbances may become so severe as to cause suicidal tendencies, and temporary insanity may occur, probably caused by pressure from an enlarged pituitary body.

Treatment.—This disease is incurable, but in any given case we can safely expect to ameliorate many of the nervous symptoms. When there is an exacerbation of symptoms, of all treatment rest is the most important, under which all the phenomena, except those produced by actual lesions, will improve. Pain, the most frequent cause of complaint, has been variously treated by all of the analgesics, but with only temporary and varied success. The bromides are often of service in relieving the headache and the feeling of pressure in the head.

The constipation should be treated, while dyspepsia, when present, can be best helped by a diet that requires but little mastication, as prognathism, which is so frequently present, is one constant cause of the dyspepsia.

Positive impairment of sight or hearing cannot be improved, and if the sight is affected at all the loss of vision will probably increase. Tinnitus aurium, if due to this disease, can probably be but little, if at all, helped.

Any tonic or bracing treatment, combined with rest, will often cause a cessation of the acute symptoms and an apparent pause in the disease, except in the last stages.

If there is atrophy of the muscles and great loss of muscular power, strychnine, given by the mouth or hypodermically, is of value, especially when combined with faradism.

Cardiac insufficiency and renal insufficiency should be treated as though they were primary diseases, without regard to the acromegalic condition.

The treatment of glycosuria should be cautious, *i.e.*, the true diabetic diet should be assumed with care, if at all. If diabetes is present, the patient might be fed on pancreas, as in acromegaly diabetes seems to be generally, if not always, of pancreatic origin.

The specific treatment of acromegaly undoubtedly must bear some relation to the secretion of the pituitary gland. I believe that, like exophthalmic goitre, we may have an increased pituitary secretion, or a diminished secretion, or a perverted secretion. In some cases, or at certain stages, of exophthalmic goitre we have a set of symptoms, such as great nervousness and cerebral irritation, exophthalmos, palpitation, and loss of weight. In these cases or at these times thyroid feeding will aggravate every symptom. In other cases we have dulling of the intellect, mild exophthalmos, cardiac weakness without much palpitation, muscular debility, and a putting on of weight—in other words, some of the symptoms of myxœdema, due to a diminished thyroid secretion, all of which symptoms ameliorate with thyroid feeding.

During the stage of almost imperceptible, gradual, and perhaps symmetrical growth of the bones, pituitary feeding would probably be of no benefit, and might even aggravate or precipitate unpleasant symptoms, such as headache. But when a case of acromegaly comes into our hands for treatment the hypophysis disease has progressed far enough to give nervous symptoms and selective enlargements so typical of the disease. At this time we are probably having a diminished amount of normal secretion or a wholly or partially perverted secretion from the hypophysis, causing terrible headaches, irregular nerve and muscle pains, vasomotor disturbances, muscular weakness, cardiac weakness, and perhaps severe cerebral irritation. For this condition and at this time pituitary substance will, I believe, often, if not always, be found of marked benefit.

In a case of acromegaly that I am now treating I have obtained good results from pituitary tablets, the dose varying from six to twelve grains a day. In this case the headache, which had been continuous for two years, is now but rarely present. While under the treatment the appetite improves, the muscular weakness disappears, the nervous restlessness is gone, and the patient is able to do her usual work, which she was not able to do before the use of the pituitary substance. Also, the hypertrophy of the soft parts of the face, hands, and feet greatly diminishes. On stopping the treatment, the headaches and muscular weakness again develop, and the face and hands very noticeably again increase in size.

It is probable that in the cases in which the thyroid gland is pathologically so changed that it cannot furnish its normal secretion, as denoted by mild myxœdematous symptoms, the feeding of thyroid extract might be of some benefit.

I do not believe that any treatment other than the above, and general tonic and hygienic treatment, is of any avail in this disease. *Oliver T. Osborne.*

ACTINOMYCOSIS.—This disease is a combination of abscess formation and new growth of connective tissue. In most cases the disease has the character of a subacute or chronic suppurative process, but in some cases the new growth of connective tissue may be so marked a feature of the process that it may present the character of a tumor or neoplasm. The disease affects man and certain domestic animals, particularly cattle, in which it is probably best known. It has a wide geographical distribution.

In cattle it most commonly affects the jaw bones, where it may take origin in the medulla or the periosteum, and may lead to the tumor-like conditions which have been long known as medullary sarcoma or osteosarcoma of the jaw, or as "lump jaw," etc. The external soft parts about the jaws and face, the tongue, the peripharyngeal tissue, the stomach, the skin, and the subcutaneous tissues in various places, may also be the seat of the disease. Anatomically, the lesions consist in general of an overgrowth of granulation and connective tissues, throughout which are distributed, more or less numerously, small, yellowish, soft suppurative areas or abscesses. If the seat of the lesions be the jaw, there is usually more or less new growth of bone as well.

In swine the mammæ, the peripharyngeal tissues, the vertebræ, and the spleen have been observed to be the seat of the disease. In horses the disease may occur in the spermatic cord after castration, as well as in the jaw bones and in the bones of the extremities. A few cases of the disease have been observed in dogs.

In man the disease is probably more common than is generally supposed. It most frequently affects the tissues in and about the oral cavity, the pharynx, and the neck. It also frequently affects the lungs, the bones of the thorax, and the intestinal tract. Almost any organ or part of the body may become the seat of the disease. Anatomically, the disease in man is essentially a destructive suppurative process accompanied by a new growth of connective tissue which in general is not as abundantly developed as in the disease in cattle, so that in man the tumor-like lesions are less frequent.

The disease is due to the action of a vegetable parasite