

Hip-joint disease : death in early stage from tubercular meningitis / by De Forest Willard ; microscopical appearances, with cuts, by E.O. Shakespeare.

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[WITH THE COMPLIMENTS OF DR. WILLARD.]

HIP-JOINT DISEASE:

DEATH IN EARLY STAGE FROM
TUBERCULAR MENINGITIS.

BY

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MICROSCOPICAL APPEARANCES, WITH CUTS.

BY

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HIP-JOINT DISEASE :

DEATH IN EARLY STAGE FROM TUBERCULAR MENINGITIS.

PATHOLOGICAL specimens of morbus coxarius in its earliest stages must ever, from the very nature of the disease, be extremely rare, and the marked ignorance of the true changes which occur at this early period is evident to all readers, not only of the ordinary text-books, but even of works devoted to pathology.

After diligent search, the specimens described in the following report have been found to be absolutely unique, presenting a stage of disease antecedent even to that of the descriptions of the initial lesion by Cornil and Ranvier.

They are therefore placed on record in this journal, that others may use their very best endeavors to secure post-mortem examinations in all cases possible, and thus add to our limited knowledge upon this subject.

The microscopical work has been, in this case, carefully done, and while it is upon one specimen only, yet in the absence of other investigations at this period of the disease it may be accepted as an accurate portraiture of the changes then taking place.

History from case-book : A. B., five years of age, one of three children, all of whom are living, presents himself at the Orthopædic Clinic of the University of Pennsylvania, November 12, 1877. His father is in good health ; the mother pale and thin, but apparently healthy ; her mother died of phthisis, and one sister of some wasting disease during infancy. The child is pale and anæmic, but has been considered healthy.

The parents are poor, and the hygienic surroundings bad.

One year ago, without any special known injury, the mother of the patient detected a slight lameness, but upon taking him to a dispensary for the treatment of deformities was, after several visits, informed that all inequality in the child's gait was due simply to "a habit which he had contracted." Reassured by this, the child was allowed to run about, and while suffering no pain, yet invariably at night complained of a sense of weariness about the hip, and a restlessness of the limb was noticed after retiring; symptoms which, I would remark in passing, are the very earliest indications of inflammation of this joint, antedating rigidity of the muscles, pain, or lameness. The lameness and discomfort have steadily increased, and the latter now amounts to a positive pain.

Present condition (child naked): walks with a decided limp, carrying the left limb with the stiff, awkward movement so common in hip disease, and evidencing a lateral, pelvic advancement at each step instead of a normal leg-swing. Weight of body thrown on sound side as soon as erect posture is attained, — standing "at ease," — thus bringing the entire strain on the uninjured member upon that non-elastic tendon or portion of fascia lata (so admirably described by Allis) which stretches from the crest of the ilium over the trochanter major down the thigh and below the knee. The leg is flexed upon the thigh, the latter upon the pelvis, the toes are everted, and the limb is abducted and apparently elongated; positions assumed by the member partially for comfort and partially from the obliquity of the pelvis, and therefore not necessarily indicating joint effusion.¹ Rigidity of the surrounding muscles is marked; the right thigh can be brought up against the lower ribs, and extended until the popliteal space touches the hard settee, without in any way altering the position of the pelvis or

¹ Kolaczek, Monthly Abstr., January, 1879, page 35.

spine; but when the attempt is made to perform either of these motions, or to abduct, adduct, or rotate the left limb, it is at once evident that the pelvis follows the femur wherever it may be moved. This precautionary fixation of the muscles is an excellent example of "joint sense," and forms a prominent indication in the direction of treatment. The left nato-femoral crease is shortened; the buttock is softened, flattened, and fades off upon the posterior aspect of the thigh without any line of junction between the two, showing a wasting of both gluteal and thigh muscles, as well as a lessened projection of the tuber ischii.

Pressure on the trochanter, knee, or heel gives discomfort but no actual pain at the hip; there is more wincing when the head of the bone is pushed against the inner side of the acetabulum than when the upper, lower, or outer surfaces are impinged upon, — presumptive evidence that the round ligament is the centre of the disease.

There is no decided tumefaction or reddening about the joint, but slight condensation of the surrounding tissues is plainly palpable, especially when the posterior part is felt through the flabby buttock.

With this collection of symptoms, diagnosis was of course positive.

Four days later the child was put to bed, extension applied by weight and cord, and the windows of the room so fastened that they could never be shut, direction being given that all necessary warmth should be supplied by extra clothing. When this precaution is taken, I have never seen injury to any person's health from confinement to bed; in fact, in the vast majority of cases the relief is so great that improvement of the general condition commences at once. I have since modified my treatment in certain cases where the inflammation is slight, but in the acute painful cases I am convinced that this method, together with fixation, secures more absolute rest and greater comfort than

can be gained by any other plan, especially when the patient is an active child, who when upon his feet would manage to receive at least half a dozen blows daily, even though he were incased in a solid sheet-iron dressing. The present case proved no exception to the general rule in regard to patients thus confined, and he continued steadily gaining in every particular, growing fat and hearty under iron and cod-liver oil.

Six weeks later there was no pain or discomfort of any kind; no induration could be felt about the joint; and flexion, extension, abduction, and adduction could be performed to a considerable extent without any pain.

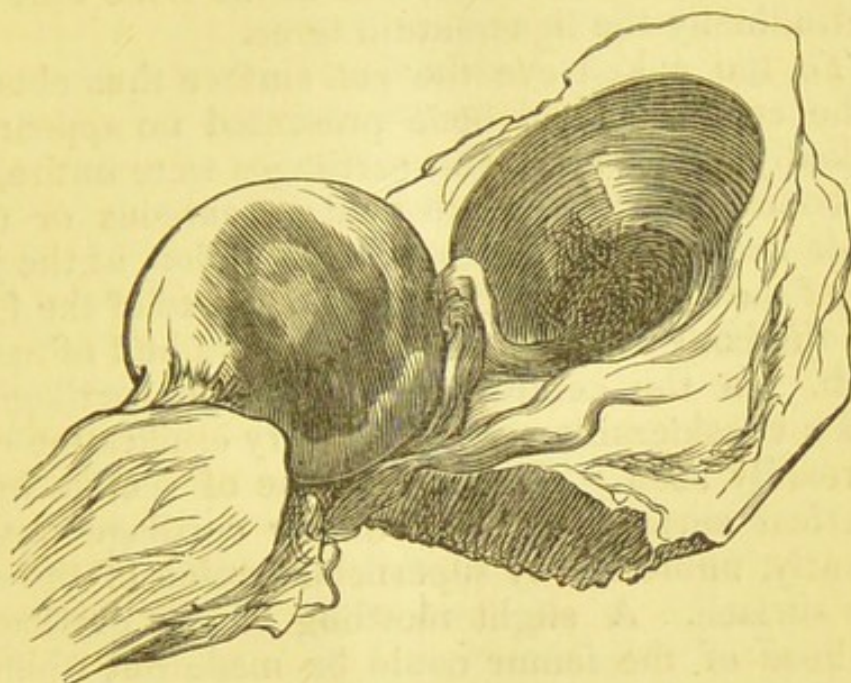
In January he commenced to complain of headache; vomiting suddenly set in, and continued persistently for three days. The pain in the head became of the most intense and excruciating character, causing piercing shrieks from the child at each onset; obstinate constipation was present; the characteristic facies, stupor, slow pulse, convulsions, and coma of tuberculous meningitis followed in rapid succession, with death upon the sixth day after the vomiting commenced, and two months after the child was first examined.

Realizing that there was here a most valuable opportunity for securing a rare specimen, every effort was made to obtain a complete post-mortem; but, after using my best endeavors, consent was gained only for an examination of the hip. Possession, however, was fortunately obtained of the head of the femur and entire acetabulum.

The movements of the joint were somewhat limited, and slight roughness was evident. There was not more than ten drops of effusion inside the articulation, but the synovial membrane was everywhere congested and softened, and at the acetabular attachment of the ligamentum teres were decided evidences of inflammation and softening of tissues. Upon the head of the femur, on its posterior upper face, was a discolored

patch, possibly caused by post-mortem contact against the acetabulum, although there was no corresponding

FIG. 1.



Acetabulum and head of femur, showing discolored spot upon latter.

spot in that cavity, and it had more the appearance of redness situated beneath the articular cartilage.

The capsule was perfect, the round ligament intact, and while the membrane covering it was more reddened and softened than at any other part, yet there were no positive signs of ulceration to the naked eye; in fact at no place in the joint were there any evidences other than those of early inflammation.

A careful and elaborate study of the minute appearances was made by Dr. Shakespeare, of Philadelphia.

MICROSCOPIC EXAMINATION BY DR. E. O. SHAKESPEARE.

“The acetabulum, head, and neck of the femur, ligamentum teres, and synovial membrane from the case of hip-joint disease referred to by Dr. Willard were placed in my hands for microscopic examination.

“After decalcification of the hard parts and harden-

ing of the soft tissues, by means of picric acid, nitric acid, and alcohol, the structures of the joint were so divided that the section cut in half the acetabulum and the head of the femur, and at the same time split longitudinally the ligamentum teres.

"To the naked eye the cut surface thus obtained of the cartilages and bone presented no appearance markedly abnormal. The cartilages were entire, and the bone did not seem to contain caseous or other visible nodules. The line of ossification, at the junction of the epiphyseal cartilaginous head of the femur with the bony neck was nearly straight and of natural width. In the central portion of the cartilaginous head a considerable area of primary ossification could be readily seen. The curved line of section of the spherical surface of the articular cartilage was, apparently, unbroken by superficial erosion of the articular surface. A slight mottling of the cartilage of the head of the femur could be made out when the articular surface was viewed *en face*. An inspection of the cartilage of the acetabulum gave to the naked eye no positive results. The ligamentum teres and the synovial membrane were evidently thickened and softened. No granulations were to be seen in them, and no visible suggestion of the presence of miliary or confluent tubercles could be recognized therein.

"A careful study of thin sections of the various tissues entering into the diseased joint afforded the following results:—

"A. Line of ossification at the junction of the head of the femur with the neck.

"Nothing abnormal was noticed beyond a small amount of hyperæmia of the medullary tissue partly forming this line.

"B. Below this line of ossification, the cancellated structure of the osseous tissue presented no decided pathological appearance. The medullary tissue was but slightly hyperæmic,—indeed, a certain number of fat vesicles were still to be seen here and there scat-

tered through it. There was nothing which could be positively diagnosed as miliary tubercles, or caseous foci, — the degenerated products of inflammation. Neither were the spicules of bone or of the primary cartilage covered by an osseous coating in a state of carious alteration; in other terms, their bone corpuscles were not undergoing fatty degeneration. The only change here visible was extremely slight, and could readily be attributable to a physiological rarefaction of the primary bone spicules or trabeculæ.

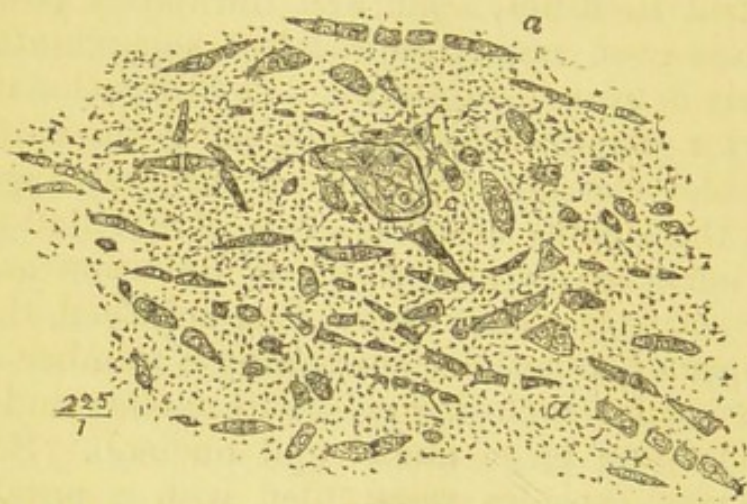
“C. Above this line of ossification, the cartilage between the latter and the before-mentioned area of primary ossification in the cartilage constituting the epiphyseal head of the femur presented, in various circumscribed localities, a marked fibrillation (which in some cases even nearly approached segmentation) of the matrix or ground substance, — a fibrillation usually following a general direction vertical to the surface of the articular cartilage. Moreover, the cartilage capsules in the vicinity of these areas of fibrillation frequently showed distinct signs of irritation and increased activity. They were often enlarged, the primary capsules sometimes containing a number of secondary capsules inclosing cells with cloudy and scant protoplasm and large nuclei and nucleoli. Some of the primary capsules were filled with a number of cells devoid of an individual capsular envelopment. In the immediate vicinage of the area of ossification in the chondral head of the femur, the fibrillation above alluded to was often much marked, as was also the irritation of the cartilage cells. In this locality, in fact, it was not uncommon to see a mucoid softening affecting some of these elements inclosed within a capsular space, but the same species of softening also sometimes produced an enlargement of the original space, and finally channeled out minute lacunæ in the surrounding matrix. (See *c*, Figure 2.)

“D. Area of primary ossification in the chondral head of the femur. Nothing abnormal met the eye

either in the bony trabeculæ or in the marrow filling more or less completely the irregular cancellæ. There was neither caries of the bone nor tubercle of the marrow. Some of the cartilage cells filling the enlarged spaces adjacent to the medullary cavities of the last-mentioned bony area were perhaps a trifle more granular and fatty than in health, and could possibly, when fused with the medulla, have added a small element of fatty or caseous degeneration to the substance of the marrow.

"E. The cartilage between the area of ossification and the articular surface in circumscribed spots showed

FIG. 2.



Cartilage of head of femur, near point of primary ossification, showing minute points of mucoid softening (c) and linear arrangement of segmented cartilage cells (a). x 225.

a hyper-activity of the cartilage capsules, accompanied by some softening and fibrillation of the intercellular matrix, similar to that previously mentioned, although much less frequent.

"Just here the general statement may be made, with respect to the character of the cartilage cells of the femoral cartilage, that except in two or three cellular layers near the articular surface, and in the normal line of ossification, nearly all the cartilage cells are spindle form (a, Figure 2), with a finely granular cell body,

sometimes containing vacuoles or oil drops, and a comparatively large, round or oval, more coarsely granular, often double-contoured nucleus, which frequently incloses one or more distinct nucleoli. The capsule, if it exists, is not distinctly visible. Usually there is no shrinking of the cell, no separation between it and the wall of the space in which it is inclosed. Very often the cell is double, and sometimes, particularly in the neighborhood of the minute points of softening, to which allusion has already been made, it is quadruple; occasionally even still more multiple. In these double cells the spindle is usually divided across the middle, so that the two cells more or less closely represent two cones with their bases together.

“In the quadruple and more multiple forms the cells are ranged in line, so that the spindle is divided by a number of cross-sections. The two end cells are conical, the apex forming the point of the spindle. The other cells, ranged in line between these two, represent more or less solid cylinders. Frequently the cells composing the spindle are separated from each other by thin septa of the hyaline matrix. Often they appear to be in immediate contact with each other by their ends. These spindles cross at various angles, but their prevalent direction is in general that of parallelism to the articular surface. Close to the border of the ossifying segment, however, it seems to be parallel to the gross curve of this segment, whilst near the straight line of normal ossification the spindles are parallel with the latter. That these cells are really spindle form, and not flat cells seen in profile, is proved by the outline which they show when seen in various directions. In longitudinal section they present the shape of a spindle. In oblique optical section they appear elliptical, and their border varies with the focus, while in transverse optical section the outline of the cell is nearly circular. The nucleus, which is usually seen in the centre, may be lost to view, and be made to appear again by alteration of

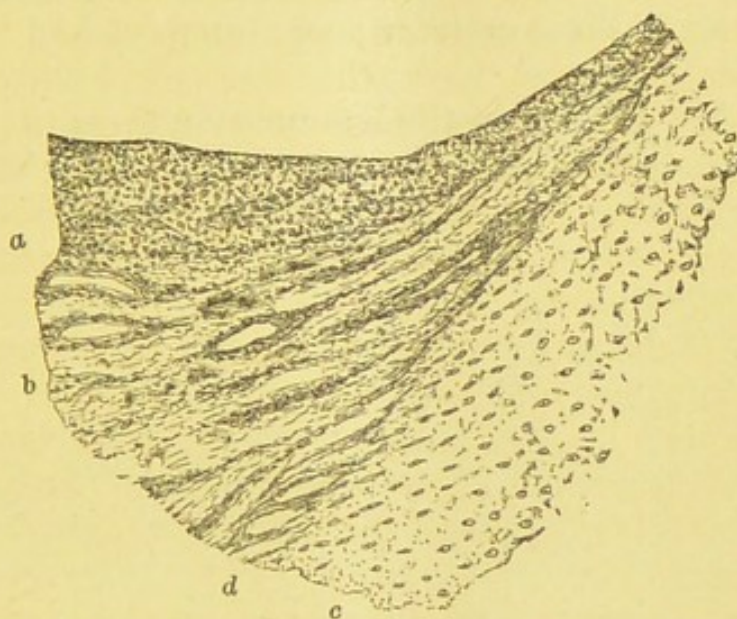
the focus. There are no layers of spheroidal cells immediately below the superficial layer of flat or lenticular cells. Neither do the cells of the deep layers have a prevalent linear direction perpendicular to the articular surface. Scattered among the spindles, here and there, are a number of cells of spheroidal contour; they may be single, double, or multiple. Near the articular surface the spindles have a tendency to flatten from above downward, and very many of these flattened cells may have three or more short, wide processes. Sometimes these processes are long and filiform, and they may unite with those of an adjoining cell. The flat or lenticular cells of the surface layers are round, oval, or polygonal in outline, sometimes are double, with a body granular or containing numbers of minute oil drops or larger vacuoles, and a large round or oval nucleus inclosing usually a nucleolus. Occasionally the nucleus may be lengthened and constricted in the middle, or there may be two nucleoli. The superficial layers of the cartilage matrix are not abnormal.

“F. Excepting as to the area of primary ossification above mentioned, the foregoing statement of the general condition of the femoral cartilage may be considered as fairly descriptive of the state of the cartilage of the acetabulum. The same tendency of the space inclosing the cartilage cells to assume the spindle form may be affirmed of the acetabular cartilage in general; but more frequently than in the femoral cartilage the inclosed cells lose the form of spindles and become flattened. In proliferating, the cells within the spaces frequently are found ranged side by side instead of end to end, this arrangement being more pronounced in proportion as the places of ossification are approached. In that portion of the septum constituting the Y-shaped cartilage which separates the acetabulum into three unequal sectors, and to which the ligamentum teres is attached, the prevalent direction of the long axis of the cell-containing spaces is verti-

cal to the articular surface, except just at and a little below the line of attachment, in which location their direction changes to that of parallelism with the course of the ligamentous bundles.

"G. Attachment of ligamentum teres to the femoral cartilage. (See Figure 3, low magnifying power.)

FIG. 3.



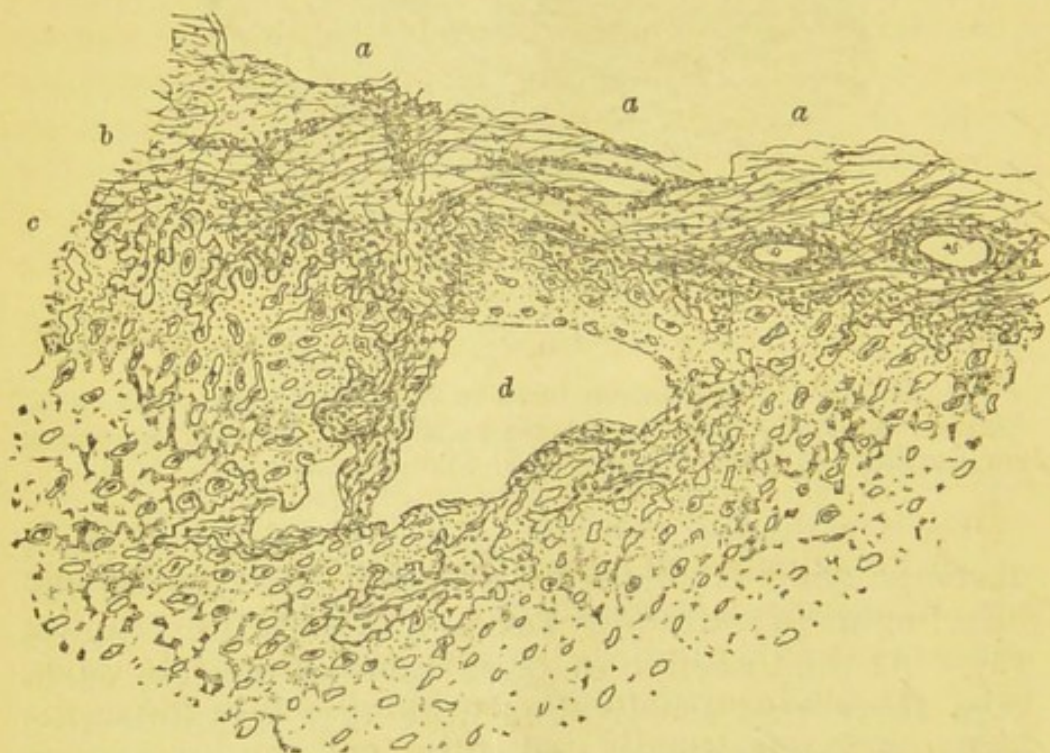
Attachment of ligamentum teres to head of femur. (a) Synovial surface of ligament. (b) White fibrous tissue of ligament. (c) Cartilage of head of femur. (d) Line of attachment. x 50.

"A few dilated veinules and arterioles and their accompanying capillaries were seen near line of the attachment (d), winding between the fibrous bundles (b). At the insertion of these bundles into the cartilage there was usually but little cell multiplication either in the tendon or cartilage. The superficial and deeper layers of cartilage at this location showed some increased activity or unusual irritation. The fibrous tissue of this end of the ligament was more vascular than it should be, and along the walls of the vessel was a more or less uniform accumulation of embryonal cells. Aside from these characteristics the tendinous tissue throughout its depth showed only a slight hyperplasia, such as is presented by young growing tendons.

The surface of the tendon (*a*), however, was covered with a loose connective tissue in an active state of inflammation. That tissue was the seat of an abundant cell infiltration, and was well supplied with vessels whose walls were embryonal, and which in a few points had become entirely transformed into a multitude of embryonal cells, forming a cylinder plugged by a mass of fibrin and blood corpuscles, both red and white. In a few spots these cellular accumulations had become caseous.

“H. Attachment of the ligamentum teres to the acetabulum. (See Figure 4, low power.)

FIG. 4.



Attachment of ligamentum teres to acetabulum. (*c*) Softening cartilage. (*d*) Anfractuous space. (*v*) Blood-vessels in ligament at line of attachment. $\times 80$.

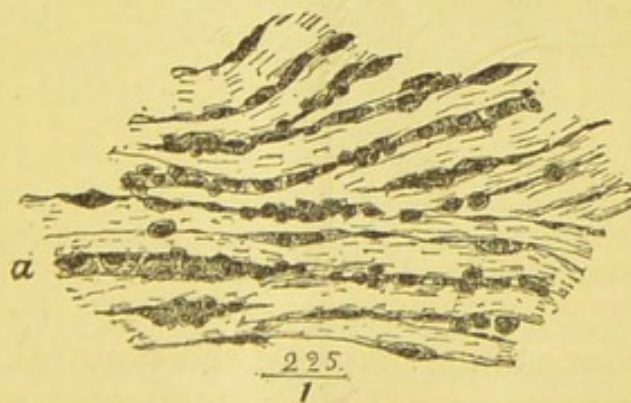
“At the point of attachment the cartilage was much softened. Along the line of attachment (*b*) the tendon was the seat of a considerable accumulation of embryonal cells. The border of the cartilage was eaten into (*c*) by this embryonal tissue in such a manner as

to present in a very marked way the irregular and the jagged outline of a surface channeled by Howship's lacunæ. Everywhere in the vicinity of the line of attachment the cavities which contained the cartilage cells were enlarged. They sometimes were filled with a mucous tissue, sometimes with a number of embryonal cells instead of the typical cartilage cell. Frequently two or more of these cavities united to form a larger anfractuous space, which might originally have been filled with an analogous tissue. Occasionally large areas of the cartilage were thus softened and replaced by a tissue very similar to the red medulla of bone, and permeated by capillary vessels. In the figure, such a large anfractuous space (*d*) is represented as partly filled by the medullary tissue and partly empty. In making the section or in manipulating it, this tissue was partly loosened and displaced before mounting.

"The fibrous tissue of the tendon near the line of attachment was traversed by numerous dilated blood-vessels. The walls of these in very many instances were embryonal. Around the vessels there was a marked increase of cell elements. The fibrous tissue itself was in much the same condition as that of the femoral end of the ligament, possibly a little more irritated.

"I. Ligamentum teres. (See Figure 5, high power.)

FIG. 5.

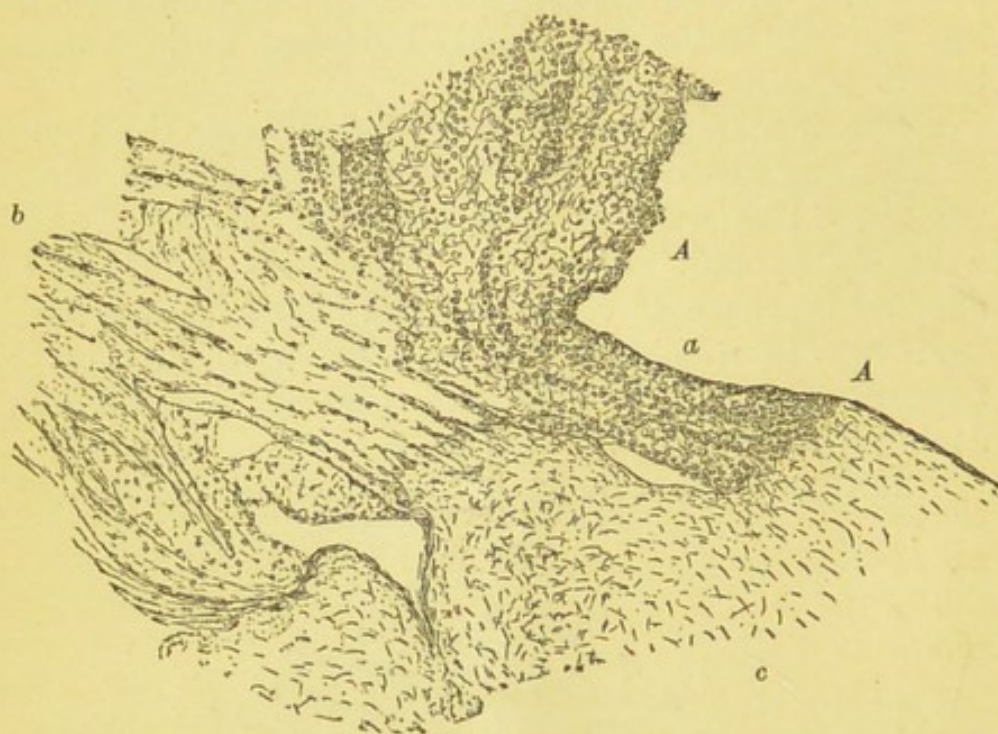


Ligamentum teres, deep portion, near acetabulum, showing proliferation of endothelia of fibrous tissues, and multiplication of leucocytes. x. 225.

The layer of loose cellular tissue which covered the ligament was highly inflamed and greatly infiltrated with numbers of young cell elements. The fibrous bundles of the tendon near the acetabular attachment and along their course toward the femoral end were in a state of marked inflammatory infiltration. Embryonal cells were abundantly scattered in the interstices between the bundles, and the flat cells of the latter were much swollen and often multiplied. The vessels were more numerous than normal, and their walls were in an embryonal condition.

“K. Synovial attachment to the periphery of the articular cartilages. (See Figure 6, representing appearances under low power.)

FIG. 6.



Attachment of the synovial membrane to the periphery of the articular cartilage of head of femur. (a) Synovial membrane. (b) White, fibrous tissue. (c) Cartilage. x 30.

“The loose cellular tissue of the synovial membrane was everywhere very thickly infiltrated with young cells. The vessels were abundant, and showed a marked cell infiltration of their walls. The cells upon

the surface of the membrane (*A*) were several layers deep. Some of them were fatty-degenerated. Others were in a state of multiplication. Numbers of embryonal cells were interspersed among them. At the point of junction of this inflamed loose cellular tissue with the cartilage of the articulation was a very decided accumulation of cells of an embryonal character, so closely heaped together that the mass presented the appearance of granulation tissue, or the young medulla tissue of bone. Adjoining this granulation tissue, and extending a considerable distance from it, the cartilage showed very much the same condition as that around the small points of softening in the femoral cartilage already described. The white fibrous tissue (*b*) upon which the synovial membrane at this location rested was in much the same condition as that of the fibrous bundles of the ligamentum teres at its femoral attachment. Where it joined the deep layers of cartilage, the latter showed signs of irritation and softening.

“Conclusions. First. It is apparent that the intensity of the morbid process in this case of hip-joint disease affects mainly the synovial membrane and the ligamentum teres and its covering.

“Second. While there is a slight fatty degeneration of the cartilage cells at the surface of the cartilage, there is no such decided alteration of this kind as Cornil and Ranvier and some other authors believe to be the initial and essential lesion in so-called scrofulous hip-joint disease.

“Third. While the femoral portion is the more diseased of the two cartilages entering into the formation of this joint, the condition of the cartilages is not sufficiently abnormal to support an assumption that the disease began in them.

“Fourth. The bony structure of the neck of the femur, although hyperæmic, is but slightly diseased, and is not tuberculous.

“Fifth. The few caseous foci found in the ligamen-

tum teres are the only points in the joint which could be taken for tubercles, and they presented no characteristic of tubercle other than the caseous degeneration of the cells, — a distinction insufficient for the positive diagnosis of tubercle.

“ Sixth. The lesions here found may be regarded as those constituting the *first* or *initial stage* of at least one form of hip-joint disease.

“ Seventh. It is probable that the sequence of the phenomena making the history of the tuberculous processes originating in hip disease obey the same general laws which govern the development of tuberculosis in other portions of the economy.

“ Eighth. The history of this case, both clinical and pathological, would seem to support the views of those who defend the doctrine that in a certain depraved animal organism inflammatory products tend to caseous degenerations, which may ultimately cause a local or general infection of the various tissues of the animal and a limited or extensive irruption of tubercles.

“ Ninth. The scrofulous or degenerative inflammation of a hip-joint need not be more certainly or more quickly followed by tuberculosis, either local or general, than a scrofulous lymph gland is followed by the same disorder.”

Remarks. By De F. W. It will not be questioned that we have here a case of undoubted hip disease, and yet this boy was scarcely ever conscious of a positive pain. It is certainly remarkable how much disease may exist in this articulation without producing any considerable amount of suffering. I frequently have cases come to me already well advanced, and yet the inconvenience is so slight as to give no more than a limp. A truly strange case was given in the *New York Medical Record* November 22, 1879, by Poore, in which the disease had even advanced to perforation of the acetabulum and intrapelvic abscess without producing any pain.

When there is “ a feeling of discomfort ” at the hip

after use, accompanied by a slight limp, we should be very careful how we pronounce it "but a habit of the child," even though rigidity and pain be absent. Did time permit I could give a number of histories of cases in which I am confident that hip inflammation, with its horrid results, was actually aborted; but to do this the patient must be taken at a very early stage, and the surgeon must make his diagnosis from a few forerunning indications.

The microscopical examinations show that the disease had at no point advanced to the stage of ulceration, and also that fatty degeneration had barely commenced, yet infection of the system had resulted; thus showing that while the inflammation could not be detected from the simple form, yet there lurked behind this process a systemic condition, hereditary or acquired (call it by what name you will), predisposing to inflammations of a low grade, — "languid."

I do not mean to assert that this inflammation was tuberculous in its character; on the contrary, it was apparently not so; but it is a well-known fact among pathologists that tuberculosis is the ultimate result of even a simple inflammation, — caseous degeneration, glandular involvement, and then systemic poisoning being the successive stages of development.

The bad hygienic surroundings of this case may have been sufficient, without tracing out any parental history of scrofulosis, to have determined the question of recovery from any slight traumatic inflammation, or have turned its course in a retrograde direction. This child died, unquestionably, of tubercular meningitis, but his hip-joint and femur did not show any decided evidences of tuberculosis, — had scarcely ever undergone either fatty or caseous changes.

It is quite common to find cases both of hip and spine disease dying of tubercular meningitis, but such a result would not occur at an early stage of the disease were the previous condition of the child untainted.

I cannot describe my idea of scrofulosis better than to say that it is an inherent property, either hereditary or acquired, which renders an individual subject to inflammations of low grade upon trivial traumatic or other causes, and that these inflammations all tend to destruction rather than to organization.

A person bearing such an influence receives a blow, and the result is an adenitis, a synovitis, or an osteitis, serious in results; in a healthy person a simple, transient hyperæmia would have followed.

These individuals are the ones who become so easily tuberculous. A joint inflammation starts quietly at first; as softening occurs the detritus is carried into the neighboring lymphatic glands. Whether caseous change has occurred or not, degeneration of scrofulous products is always the rule, and from these niduses of poison the products swept on contaminate the general system, and tuberculosis is the result. Such is the explanation given by Cornil and Ranvier of the relationship between scrofulosis and tuberculosis, and it seems to lie nearer the truth than does the idea of looking upon inflammations as necessarily tuberculous in their inceptions. It is a well-known fact that there exists in certain animals, as guinea pigs, a marked predisposition for all inflammations to run into a cheesy degeneration, and that even a superficial point of inflammation is sufficient to induce tuberculosis.

In such a condition is the person who has lived under unfavorable sanitary surroundings, or has received a destructive legacy from his ancestry.

Tubercles in bones are preceded by osteitis; hence there is often a caseous change in the marrow, but not so often in the bone corpuscles. A cavity in a bone, even though lined by granulation tissue or filled with pus or cheesy material, should not be considered necessarily tuberculous unless the microscope develop tuberculous granulations in surrounding tissues.

I do not believe that we shall find tubercle in the bones in the early stages of the majority of joint in-

flamations, although Kortweg¹ contends that in all cases of chronic knee-joint synovitis the presence of tubercle in the condyles of the femur can be demonstrated, and that the synovitis is only a secondary result by extension. Berry's idea is very similar.²

Professor H. H. Smith³ thinks that "the deficient action of the myeloid cells is closely connected with the development of leukæmia and pernicious anæmia, and that 'hæmic cachexia' in many points closely corresponds with the condition known as *scrofulosis*, and that this condition or similar disordered nutrition of the myeloid tissue leads to and aids the development of *tuberculosis* and the retrograde action of tubercle in bones."

Cornil states that one characteristic of *scrofulosis* seems to be a misproportion between the volume of the blood and the weight of the body, and that this is most evident when the inflammatory process is set up, the tissues possessing but little resistive power.

The inherent virus is vitalized at least by the absorption of the products of inflammation existing in the foci of caseation and liquefaction, and the lymphatic glands once passed general infection must follow.

That hip-joint disease is exceedingly liable to be followed by general tuberculosis is a well-established fact. Professor Gross as long since as 1858, in the *North American Medico-Chirurgical Review*, wrote a carefully prepared article upon this subject, giving many illustrations, with numerous dissections of diseased joints; while, in an article by Poore, in the *New York Medical Record*, May 1, 1880, it is shown that as many cases died of tuberculosis after prolonged suppuration from the hip as of amyloid degeneration; the same will hold true in regard to caries of the vertebræ.

Another point of interest in the case under consid-

¹ P. Med. Times, July 6, 1878, page 469.

² N. Y. Med. Rec., January 30, 1880, page 113.

³ Pathol. of Tubercle in Bones, Transac. Am. Med. Assoc., 1877.

eration was that although no osteitis was present, yet reflex muscular spasm existed most markedly, in opposition to the statement of Shaffer, that this symptom "always indicates osteitis in chronic joint disease."¹

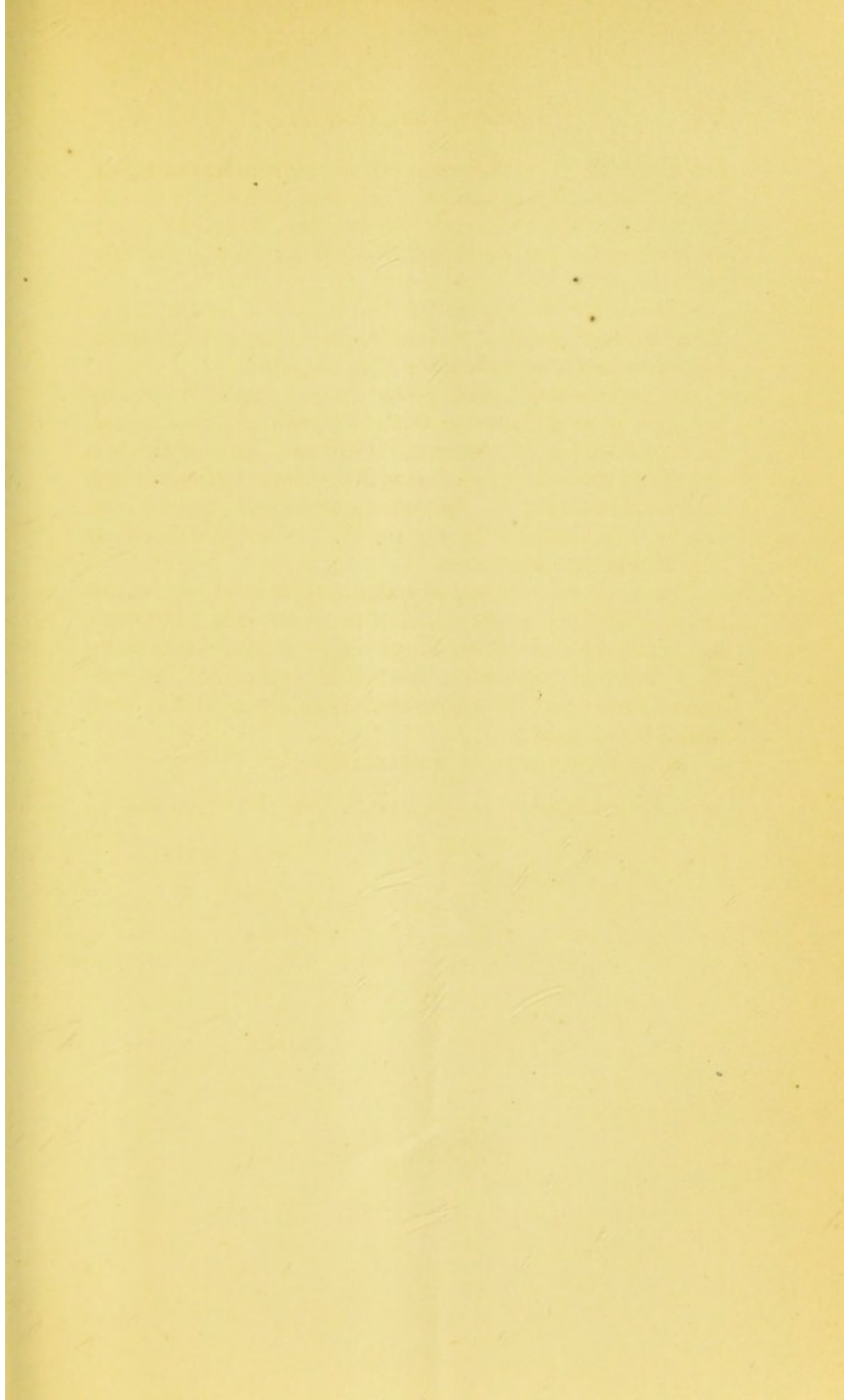
When osteitis is present the irritation of the nerve filaments is usually sufficient to give pain, yet muscular spasm often long antedates this condition.

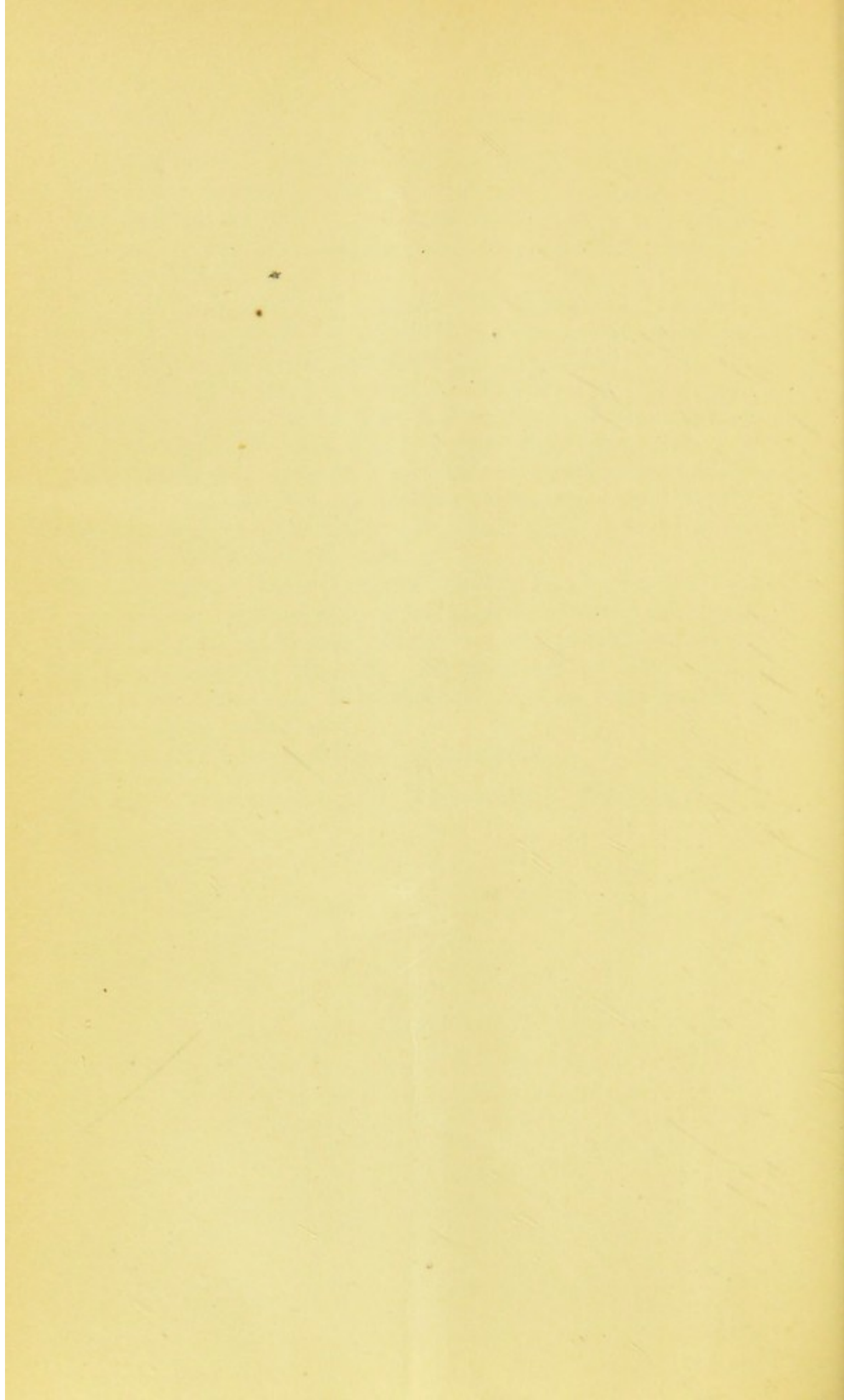
In conclusion, I would say that we are still greatly in need of positive facts, both clinical and pathological, in regard to joint diseases. Our only safe method is carefully to study each case with an unprejudiced mind, not endeavoring to distort appearances to suit our views, but permitting our minds to be influenced by the things actually seen.

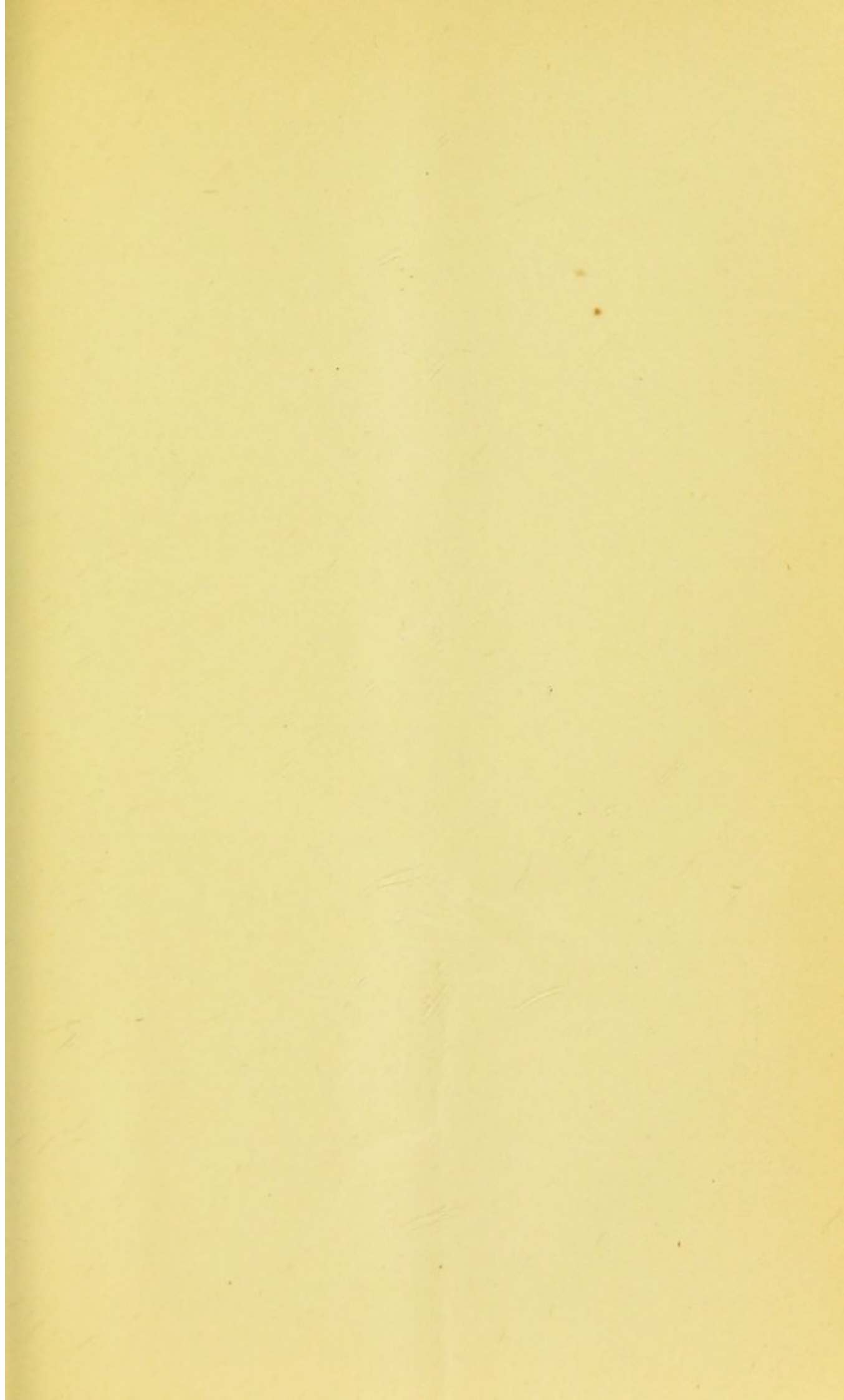
This one microscopical examination is of course but from a single case, yet it has value in showing extremely early, if not indeed initial, changes actually occurring in a diseased hip-joint. Its teachings are left for individual decision; its impression upon my mind has been already indicated.

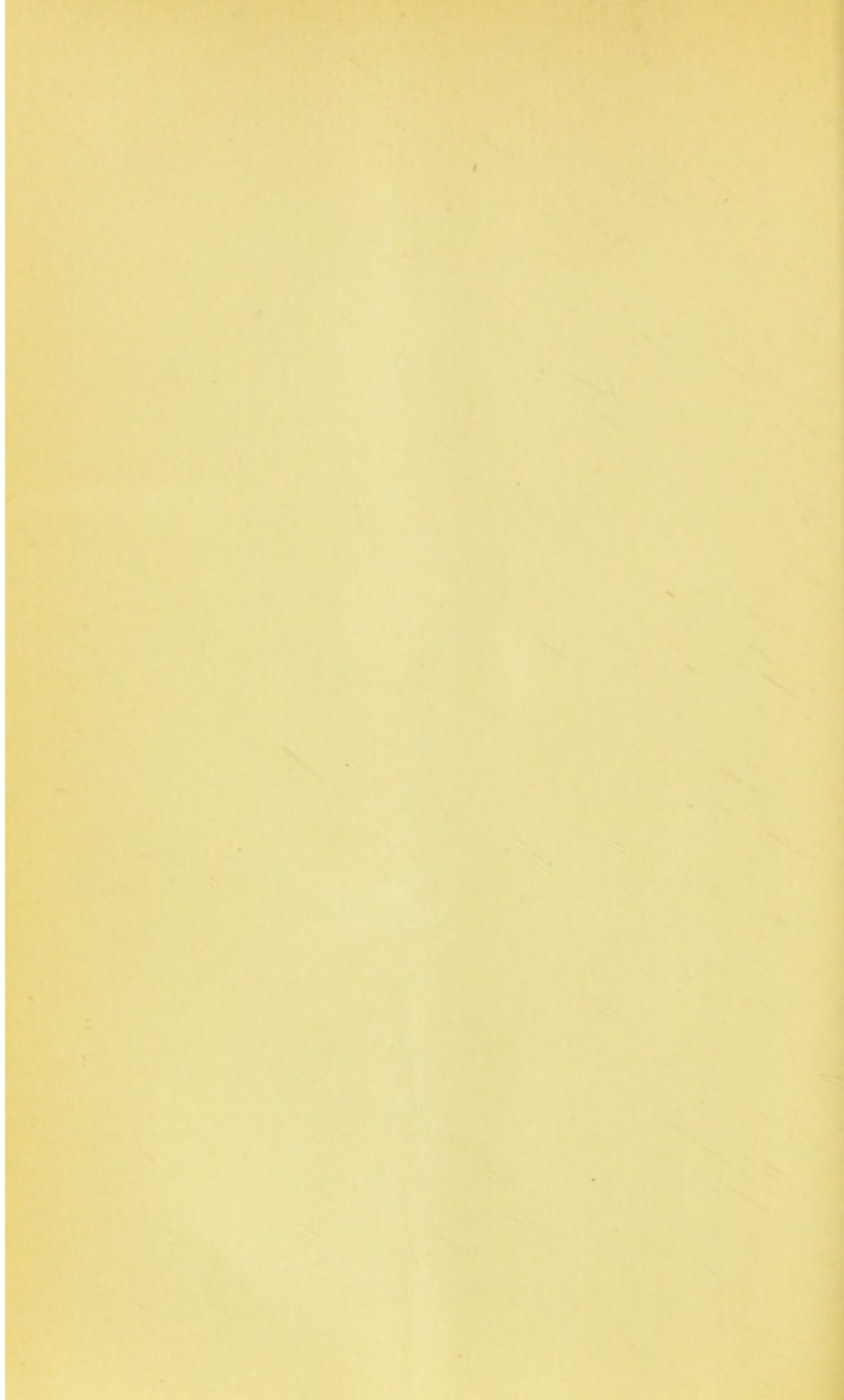
1626 CHESTNUT STREET, PHILADELPHIA.

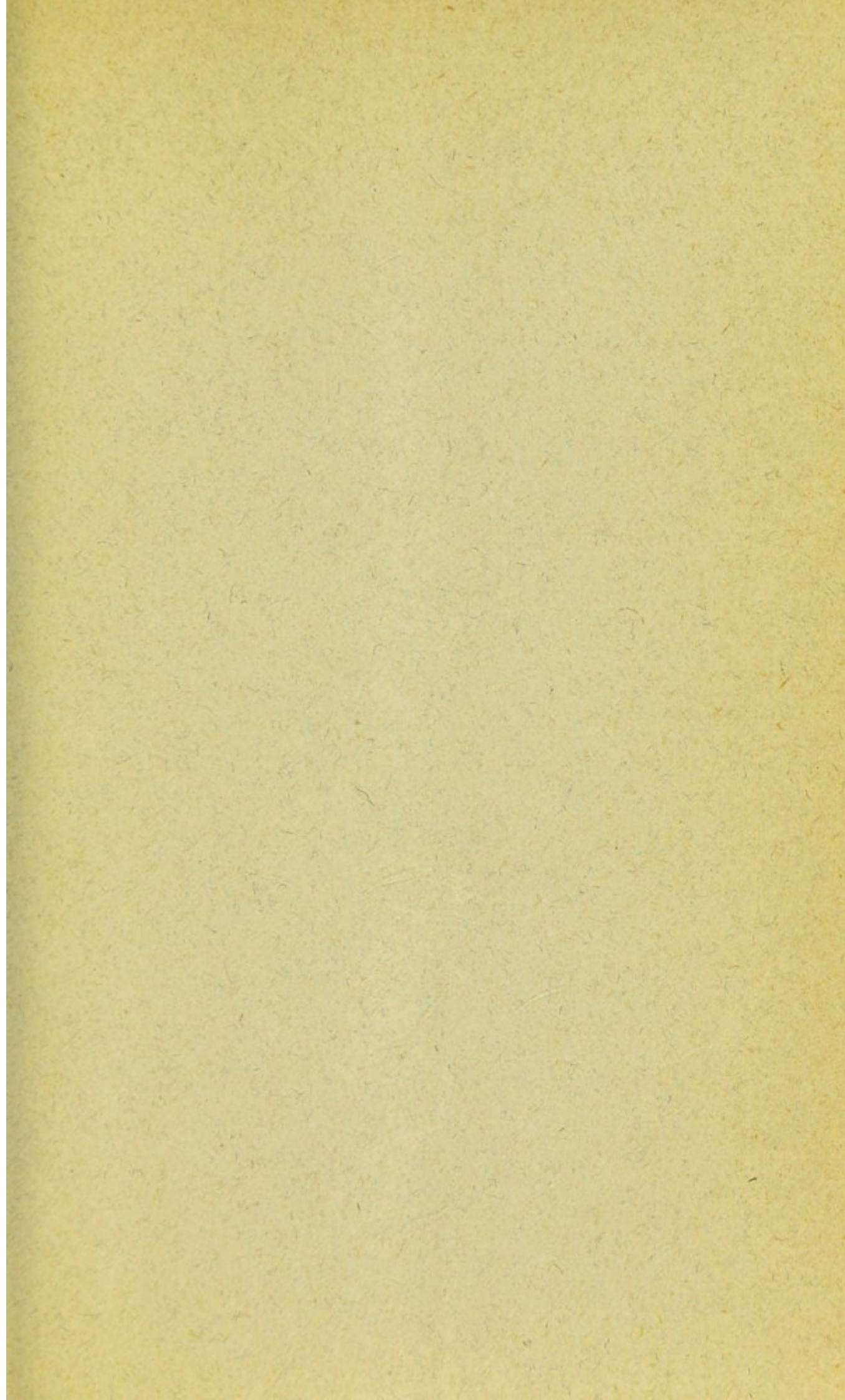
¹ Pott's Disease. G. P. Putnam's Sons. 1879, page 28.











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