Surgical and pathological observations / by Edwin Canton.

SURGICAL AND PATHOLOGICAL OBSERVATIONS.

London:
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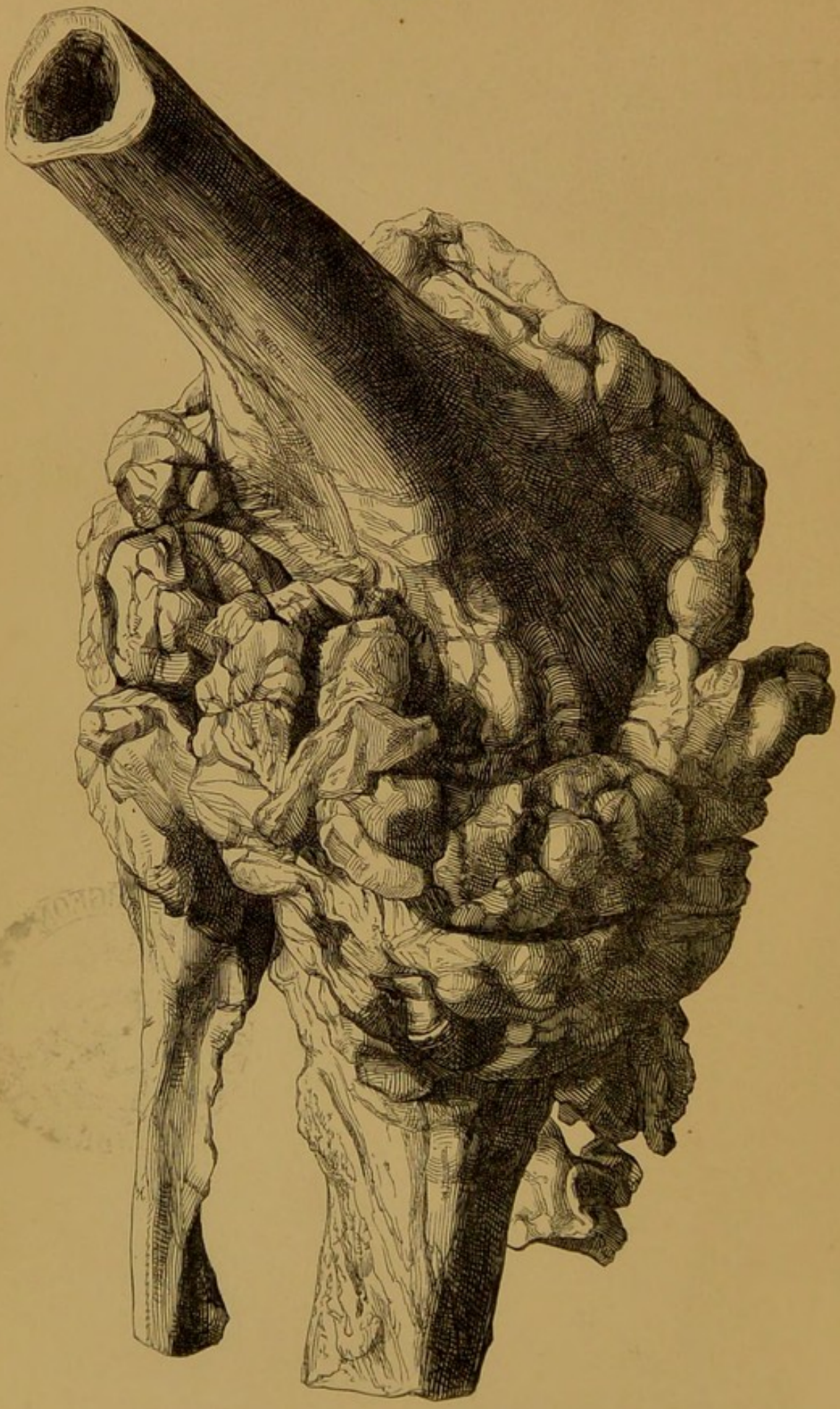
PLATE I.



with the Author's acknowledgement of great kindne

SURGICAL AND PATHOLOGICAL OBSERVATIONS.

BY

EDWIN CANTON, F.R.C.S.

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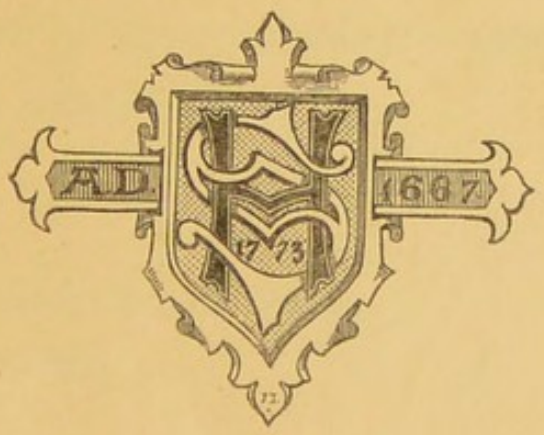
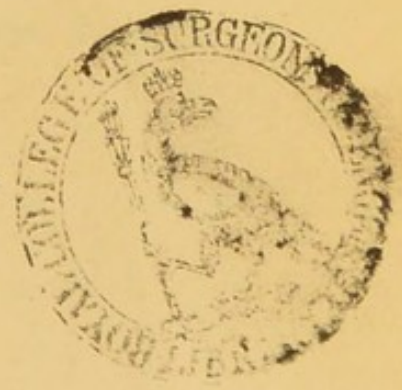




LONDON:

SAMUEL HIGHLEY, 32, FLEET STREET.

1855.

ADVERTISEMENT.

The following "Observations" have already appeared, at various periods, as contributions to *The Lancet* and *Medical Gazette.*

The Author has endeavoured to amplify, amend and illustrate them; and trusts that he does not over-estimate their importance in, now, venturing to submit them to the Profession in a collective form.

4, Montagu Street, Russell Square,
Jan. 1855.

CONTENTS.

PATHOLOGICAL AND SURGICAL OBSERVATIONS.

ON

CHRONIC RHEUMATIC ARTHRITIS,

CONSIDERED ESPECIALLY IN RELATION TO ITS MORBID ANATOMY.

This singular and intractable malady has for some years past engaged the attention as much of the surgeon as the physician, and its pathological peculiarities must always prove a source of the deepest interest to both. It invades the small and large articulations: equally may it affect those of the fingers and toes, or of the knee and hip; inducing in them the most unsightly deformity, and permanently impairing their functions, so that the power of prehension is lessened or lost, and locomotion is perverted or prevented. The joints of the lower jaw may experience an attack, when discordance of speech ensues, and mastication of food becomes difficult. The spinal column may suffer, and the body be irremediably contorted, whilst internal organs are thereby secondarily and often seriously affected. Exostoses (osteophytes) very characteristically spring forth from near the joint-surfaces of the bones: cartilaginous productions may lie, in large numbers, freely in the articulation, or project pedunculated within it, associated

with groups of vascular, synovial fimbriæ; the encrusting cartilages become absorbed, and the exposed bone is hardened and eburnated: the fibrous structures around are in part removed, and in part encroached upon by ossific deposits, which must in their progress of formation press injuriously upon the nervous filaments in their vicinity, and thus superadd continued irritation, as they are producing insuperable disfigurement and impeding freedom of motion. The muscles in the neighbourhood become powerless, as atrophy and degeneration implicate them. Alike may all the varieties of moveable joints be affected, from the simple arthrodia to the perfect enarthrosis; and these, even in their minutest examples in the body, may, I believe, succumb to the inroads of this malady—I allude to those of the *ossicula auditûs*— and hence the power of hearing be diminished or lost. On this latter point, however, I merely surmise; but analogical considerations support the probability.

"Referable without doubt," says Dr. Fuller,* "to some constitutional peculiarity closely connected with perverted assimilation, this disease selects as its victims either the weakly or unhealthy, in whom the natural excretions are imperfect or deficient, or else fixes upon those who, though usually robust, have been subjected to some cause of mental or bodily depression. It attacks the girl just arriving at puberty, in whom the uterine functions are ill-performed; it invades the stiffening articulations of the woman who has arrived at that time of life which is marked by the cessation of the monthly periods; it shows itself during the state of debility which follows a miscarriage or a difficult or protracted labour, more especially when the labour has been accompanied by flooding; it is a frequent attendant

* On Rheumatism, Gout, and Sciatica, Lond. 1852.

upon renal disease, and a common sequel of over-long suckling, of excessive venery, of severe and long-continued mental exercise, and of mental distress and bodily exhaustion. Neither age nor sex affords immunity from its invasion; but most commonly it shows itself from the age of 35 onwards, and its earliest attacks are usually seen in girls whose uterine functions are suspended or ill-performed."

As highly illustrative of the fact last mentioned—viz. the occurrence of this malady at an early age in the female—and as strongly characteristic of the serious extent to which the joints may become affected, I would quote the following case from Dr. Todd's Croonian Lectures:—"Among the inmates of the Wandsworth Union is a poor girl, aged 25, who is the most complete martyr to this disease in all her joints—even in those of the cervical vertebræ. She is so crippled that it has been found necessary to construct machinery in order that she may be lifted easily out of bed to have it made. The elbows are semi-flexed, and almost anchylosed; the hands afford an extreme instance of the affection; very little motion is enjoyed at the hips; the knees are nearly anchylosed, and the legs are bent, not under the thighs, but to the left side; the ankles are nearly immoveable, and the joints of the tarsus and toes are beginning to stiffen, and their bones to be nodulated. The girl first observed the catamenia at the age of 17, and she was liable to leucorrhœa. About this time she caught cold, and was attacked with rheumatic fever; her knees, ankles, hips, elbows, and wrists being greatly swollen and exquisitely painful. After this she had exacerbations of the rheumatic pains, with which was always associated a scanty and difficult excretion of the menses, and at one time a deciduous membrane was discharged. For five years the joints have been gradually passing into the

state of frightful deformity and rigidity which they now exhibit."

I am induced still to mention another case, occurring at a more advanced age than the last, and the particulars of which were furnished by Dr. R. Adams to the Pathological Society of Dublin.

Charles Mailly, aged 48, a farmer's servant, was admitted into the North Union Poorhouse in 1840. He was totally disabled from earning a livelihood, in consequence of his having been long afflicted with chronic rheumatism in all his joints. The fingers were distorted and characteristically drawn to the ulnar side of the hand, and all the knuckles presented specimens of nodosity; his wrists were rigid; his elbow-joints, contracted to a right angle, could not be extended; his shoulders were also affected. The coverings formed for them by the deltoid muscle seemed to have lost their usual thickness, and the head of the humerus could be observed to be elevated and rendered somewhat prominent in front. Such was the state of his upper extremities that he could not feed himself, and of his lower limbs, that he had been bed-ridden for the last five years. He suffered much in all his joints during changes of the weather, and the usual crackling sound, or articular crepitus, was noticed when the joints were moved. We learned that he had lived very intemperately, and that on one occasion, when completely overpowered by drunkenness, he had lain out all night in the open air, in consequence of which he became affected with a rheumatic fever, which ultimately subsided into the slow fever of chronic rheumatic arthritis in all his joints.

Symptoms.—It might be reasonably supposed that the serious mischief which the joint-textures are suffering would be accompanied in its gradual progress by grave and distinctive characters; and such is found to be the case,

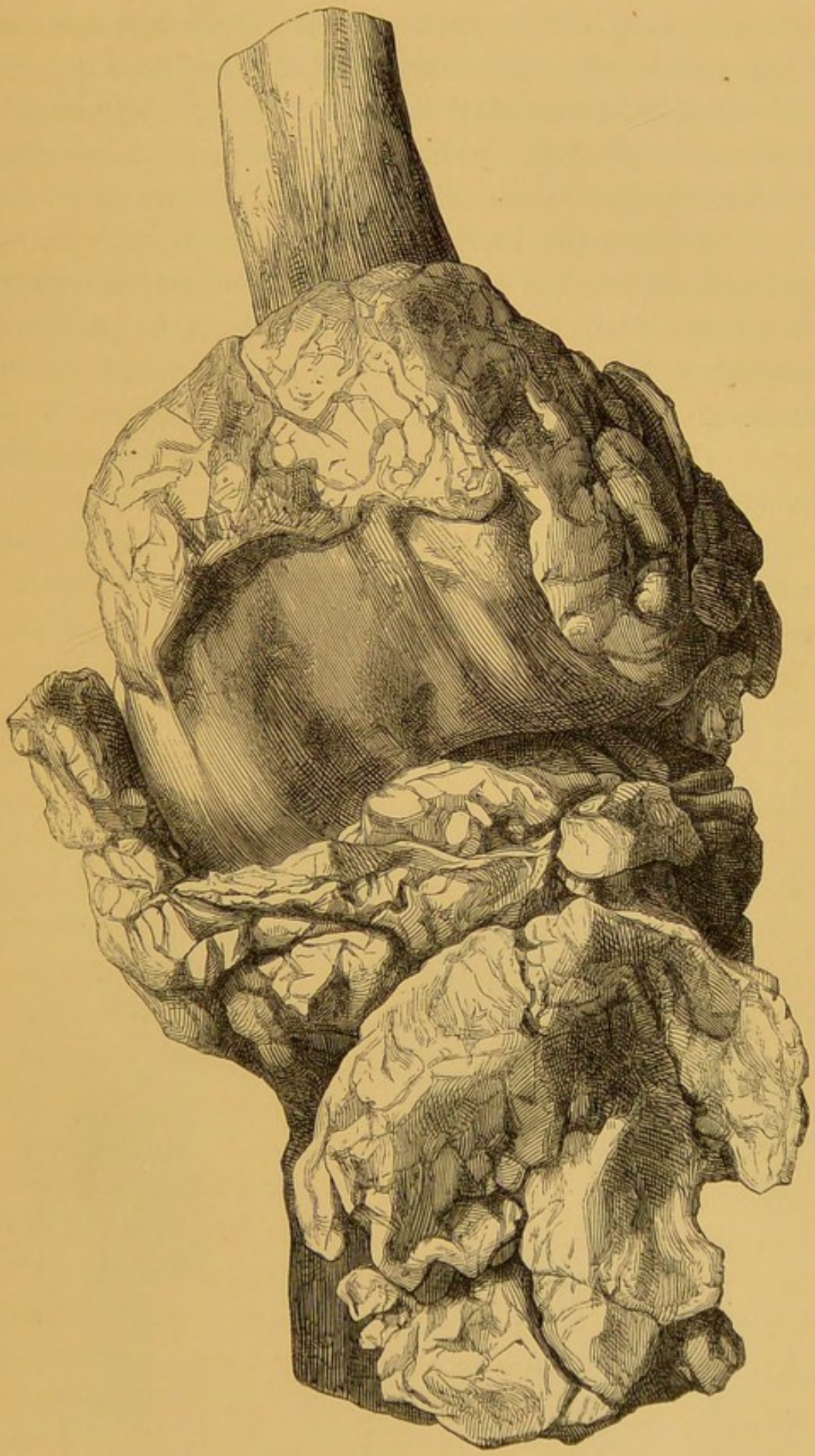
whether the disease has arisen from causes already specified, or been induced in some particular part, as occasionally happens, by local violence inflicted upon the articulation. The symptoms are peculiar, and partake more of the rheumatic than any other order. The pain is of a dull, heavy, and wearisome nature, aggravated at night and during inclement weather; a feeling of stiffness pervades the part, and there is unwonted restraint in its movements. The stiffness and impaired mobility are most marked and annoying in the morning, but they by degrees subside as the day wears on and the joint is exercised; towards evening, however, these symptoms become aggravated. There is neither redness nor increase of temperature over the joint, which slowly but steadily enlarges, whilst the softer textures around as assuredly waste away, or are rigidly fortified by bone; pressure of the articular surfaces against each other elicits no expression of pain, but when the disease is further advanced great uneasiness is caused by rotation or certain other movements of the limb, and at the same time a peculiar grating (articular crepitus) is both felt and heard, not only by the medical man, but commonly by the patient himself. The bones, now denuded of cartilage, have been made to rub roughly upon one another, and hence the sound and sensation. The bowels are most frequently costive—a state which, with the sallow skin and pale, lumpy, fœtid dejections, bespeaks the torpid condition of the liver; the appetite is impaired and wayward, indigestion is a frequent concomitant, the sp. gr. of the urine is low. Ulceration and suppuration never occur in the joint, nor is the disease prone to result in anchylosis,—except, indeed, that particular form of it where bony matter is thrown out copiously around, so as to form, as it were, a closely-jointed osseous cincture which shall effectually impede the movements of the articulation.

Morbid changes.—I have already in the first portion of this paper alluded, generally, to some of the local effects of this disease, but shall now pass on to a more detailed consideration of them, premising my remarks with the following observations by Mr. Colles, of Dublin :—

"The great distinction of these processes from ordinary inflammation consists in this,—that in chronic rheumatic arthritis two very opposite processes are to be found going on at the same time—viz. absorption of the old bone and its cartilage of incrustation, with deposition of new bony matter; whilst in ordinary inflammation there would be simply a gradual enlargement of bone. It is worthy of remark, that in the malignant disease of the joints, and in strumous affections of them—both connected with constitutional taint—there is the same tendency to the formation of exuberant osseous growths around the joints, while the articular textures within are suffering destruction and decay."

Bones and Cartilage.—At their articular extremities the bones appear to be considerably enlarged, and at the same time so changed in form as to have lost much of their original shape. Larger and smaller osseous processes spring from the margins of the joint-surfaces, and mix in with those which are studding the fibrous textures around, so that one part not uncommonly becomes almost immoveably locked into another. This is frequently to be seen in the hip (Fig. 6), and is well shown in the knee-joint at Plate II. The ossific outgrowths, where they arise from around the margin of the encrusting cartilage of the head of the femur, are thick, and overhang the neck of the bone so as to conceal it from view to a great extent, especially at the posterior and lower portion, and where the cervix has not suffered much from interstitial absorption. On the other hand, where the neck has wholly disappeared,

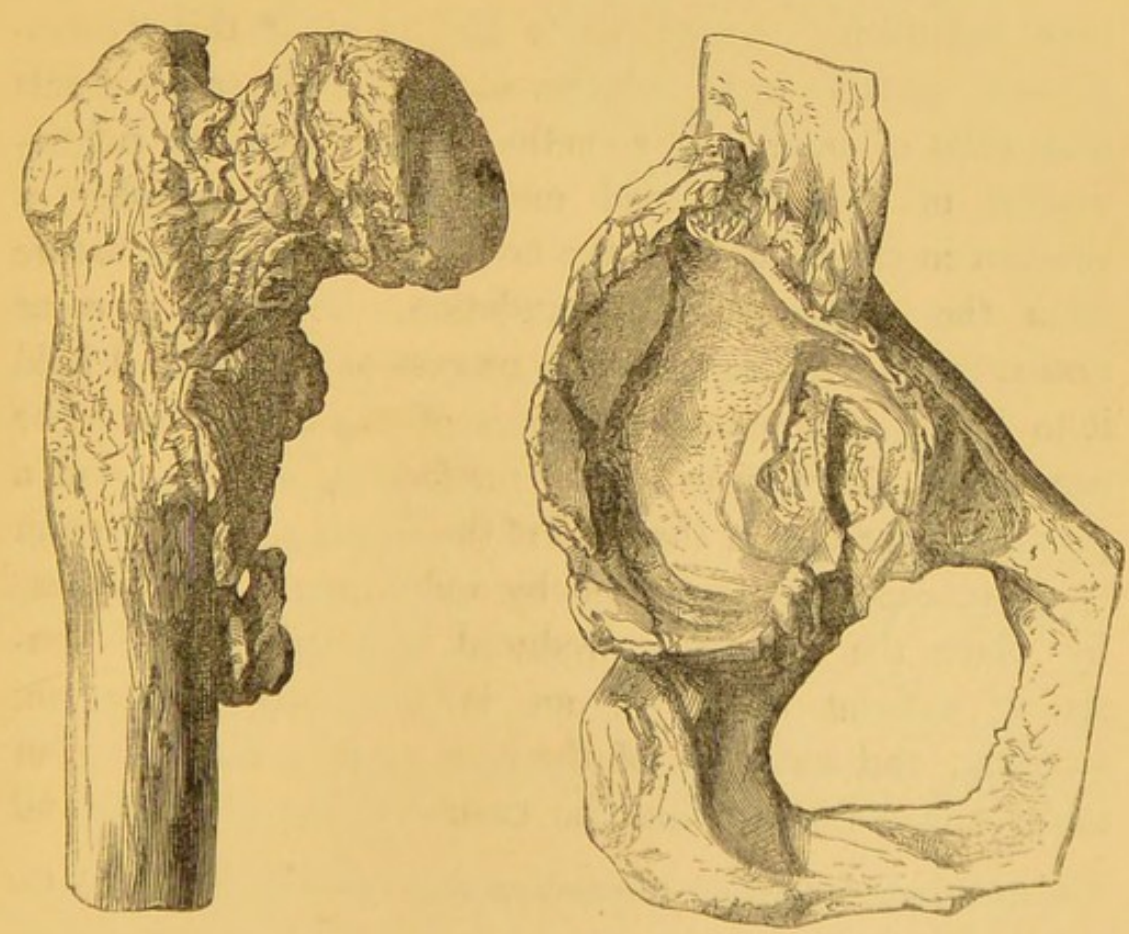
PLATE II.



or almost entirely so, the head of the bone appears as though it had sunk in between the two trochanters and its osteophytic cincture to become incorporated with the bony growths which likewise encumber these latter processes. This shortening of the cervix femoris is very characteristic of chronic rheumatic arthritis, and especially so is the horizontal position it assumes, or the still greater depression it suffers, whereby a direction shall be given exactly the reverse of its natural one. The lower limb is shortened in proportion as the one or other of these conditions obtains, and the foot becomes more or less everted.

With the augmented volume of the head of the thigh-bone there is a corresponding increase in the capacity of the acetabulum, and the form of the one becomes closely adapted to that of the other, however great the irregularity

Fig. 1.



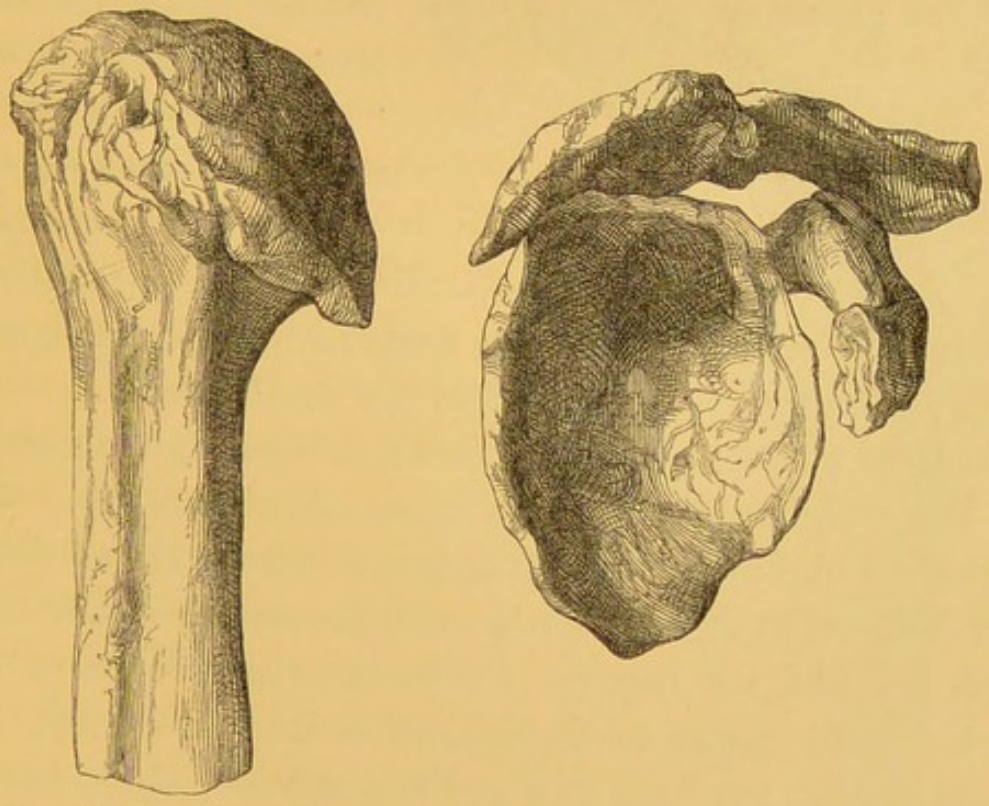
of such form may be. This, though the general rule, is not, nevertheless, without its exception, as will be seen in the above sketches, wherein the area of the acetabulum is shown to be far greater than that of the part it accommodates. Wasting and removal of the Haversian gland, with occupancy of its place by bone, absorption of the interarticular, and calcification of the cotyloid and transverse ligaments, are very common conditions in this affection. When a section of the bones is made at the site of the disease, the cortex will be found to be thinner than natural, except in those situations where eburnation has occurred, and there it will have become abnormally dense, from new and very compact bone occupying the Haversian canals (Fig. 6): the medulla is preternaturally large in quantity, and quite oily, whilst its investing membrane is unduly vascular. The bone is often extremely soft and porous, so that pressure of the finger may indent it. According to Rokitansky,* this "osteoporosis" consists in an enlargement of the Haversian canals and cells of bone. It sometimes arises from an inflammation of the bone and medulla, which furnishes a product in the cavities of the bone differing in its nature from the ordinary ossific exudation. The *morbus coxæ senilis* appears to originate in a process of this kind. I hold it to be an inflammatory process of a gouty character, he continues, which gives rise to rarefaction, swelling, and a peculiar deformity of the head of the femur and acetabulum —an osteoporosis succeeded by induration. The process by which the change is produced is a painful one, consisting without doubt of an inflammatory rarefaction, swelling, and softening of the bone. After furnishing an osseous exudation within the tissue of the bone and all

* Pathological Anatomy, Sydenham Society's Translation, vol. iii. p. 171.

around—an exudation which may be distinguished by its form and chemical composition—it terminates in consecutive induration. To these peculiar views of Rokitansky I shall have occasion again to advert.

In the shoulder we frequently meet with the close counterpart of those changes, as I have described them, which occur in the hip-joint, and the subjoined sketch will show how strikingly they are here repeated.

Fig. 2.

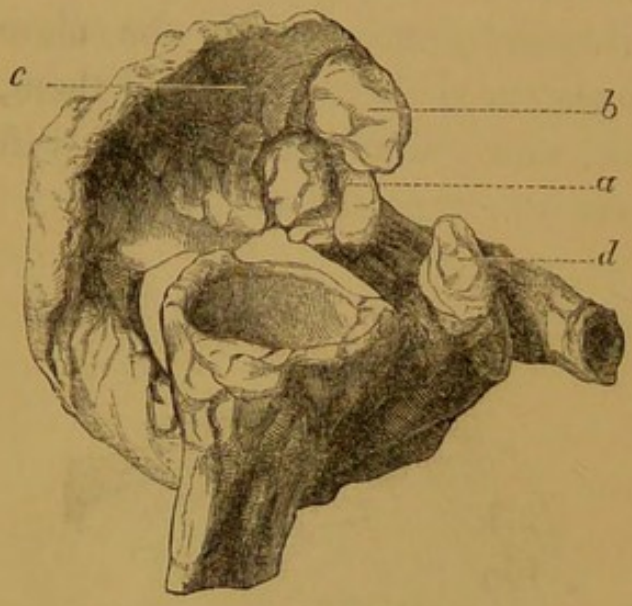


The flattening of the articular surface of the humerus, together with its increased extent and surrounding and overhanging osteophytes, are accurately delineated. The form of the glenoid cavity of the scapula, though changed, is accommodative, and an articular surface is seen to have been established on the outer side of the end of the coracoid process, so as to receive, in part, the play of the outspread head of the humerus.

I would fain add another sketch from a specimen in my possession, wherein it will be seen how the bony processes

around the head of the humerus afford surfaces for the play of that part in an advanced stage of the complaint.

Fig. 3.

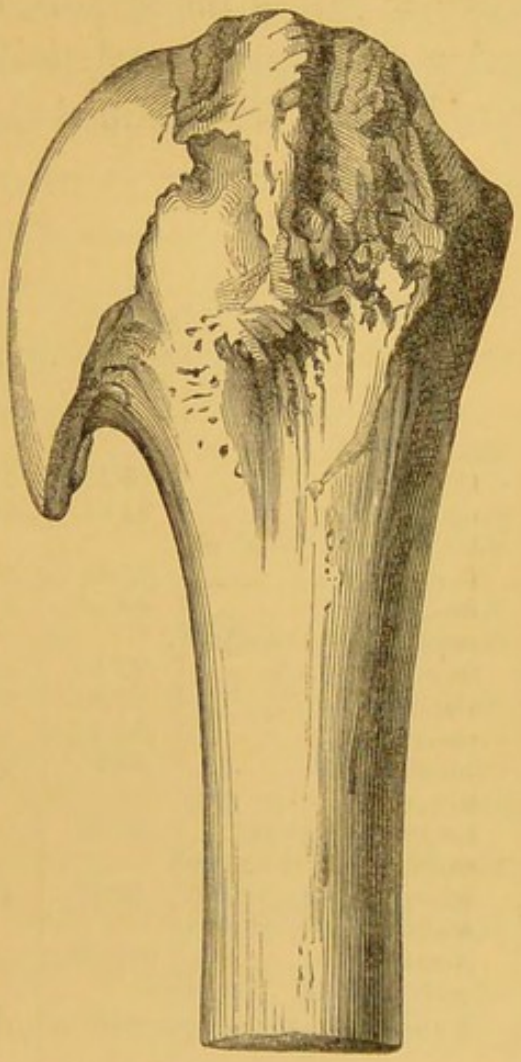


An eburnated surface (*c*) exists upon the under surface of the acromion, of which a piece has been broken off (*b*): the outer end of the clavicle (*a*) intrudes into the joint to increase the extent of the "supplemental cavity;" whilst the outer surface of the end of the coracoid process is porcellaneous (*d*), and, like the other parts mentioned, affords a resting-place for the updrawn head of the humerus.

Such appearances as I have now mentioned, presented by the bony structures of the hip- and shoulder-joints when affected by chronic rheumatic arthritis, were in former days often believed to depend solely upon that atrophic condition which pervades the osseous system in advanced years, but which is most prone to display, in a marked degree, its peculiarities in the large ball-and-socket joints of the body: hence the disease in the hip passed, for a long while, under the name of "*morbus coxæ senilis;*" and in the Med.-Chir. Trans. for the year 1837 will be found a most able and well-known paper, by Mr. Curling, on "some of the forms of atrophy of bone," wherein he describes "a change very similar to that noticed in the head of the femur, as the result of the *eccentric atrophy of old age*, attended with softening, sometimes taking place in the head of the humerus. But as this bone is attacked at a later period, and is subjected in a much less degree to the influence of

pressure, the depression and alteration in figure are by no means so remarkable as in the femur. A good specimen, illustrating this change in the head of the humerus, is contained in the collection of morbid specimens at the London Hospital." The annexed sketch is copied from the figure of this bone, which the author appends to his paper in illustration of the opinion which he formed respecting it.

Fig. 4.



Believing, from the frequent opportunities which I had enjoyed, some years ago, of inspecting these parts in advanced life, and also when affected with the chronic rheumatic complaint, that Mr. Curling had fallen into error respecting the nature of the change in the bone he alluded to, I forwarded to him a sketch of the parts from which my own drawings were taken, and in venturing to submit my views of their pathological bearings, I was pleased to find that this gentleman with liberality and at once wrote to me thus:—"The depressed head of the humerus figured to illustrate my paper in the 20th vol. of the Med.-Chir. Trans. I have now little doubt was the result of chronic rheumatic arthritis, as you suppose."

In a paper by Mr. Bransby Cooper, contained in Guy's Hospital Reports for the year 1847, on fracture of the

neck of the thigh-bone, the interesting fact is communicated, that a considerable diminution of the previous amount of earthy matter takes place in the head and neck of the femur of persons who have passed the age of 50, and this point is brought to bear in a striking manner upon the subject of non-union of the cervix after its intra-capsular fracture. From analogical considerations I was induced to believe that the circumstance referred to would find a parallel in the upper portion of the humerus and articular part of the scapula, after the above-mentioned age; and a subsequent analytical inquiry (made by my friend Mr. Harper) has justified the correctness of the idea.

	Amount of Earthy Matter.			Amount of Animal Matter.		
	Articular Part of Scapula.	Head of Humerus.	Shaft.	Articular Part of Scapula.	Head of Humerus.	Shaft.
Male, æt. 25, (died of Phthisis)	45·26	36·86	59·83	54·74	63·14	40·17
Female, æt. 82	32·47	24·70	36·42	67·53	75·30	63·58
Male, æt. 61, (died of Fever)	32·88	23·19	54·70	67·12	76·81	45·30
Female, æt. 80	40.50	27·19	44·59	59·50	72·81	55·41
Female, æt. 78, (died of Scirrhus Uteri)	30·40	23·53	48·64	69·60	76·47	51·36
Male, æt. 78	32·30	26·29	49·59	67·70	73·71	50·41
Female, æt. 70	36·32	26·13	46·54	63·68	73·87	53·46
Female, æt. 89	40·00	23·40	47·22	60·00	76·60	52·07
Male, æt. 75, (a fine muscular subject)	41·50	39·70	59·35	58·50	60·30	40·65
Female, æt 80, (Chronic Rheumatic Arthritis)	23·13	29·49	61·76	76·87	70·51	38·24
Female, æt. 80, (ditto: Acetabulum)	23·46	...	...	76·54	...	...
Female, æt 80, (ditto: Femur)	...	22·43	43·00	...	77·57	57·00

Ivory or enamel-like deposit; porcellaneous condition; eburnated bone.—A peculiar feature in this affection is the change so commonly seen on the joint-surfaces, and well known to all by the above appellations. This so-called "deposit" replaces cartilage,—forms for it an efficient sub-

stitute, and though wanting in the pliancy and elasticity of the original, presents both polish, evenness, and density, to ensure a certain extent of facility in motion, and guard against injury from friction. It is found, too, in situations where no cartilage had previously existed; and as new articular surfaces are being formed to accommodate a bone in its altered position, a provision is required to maintain freedom of movement, and the necessity is responded to by the presence of this material.

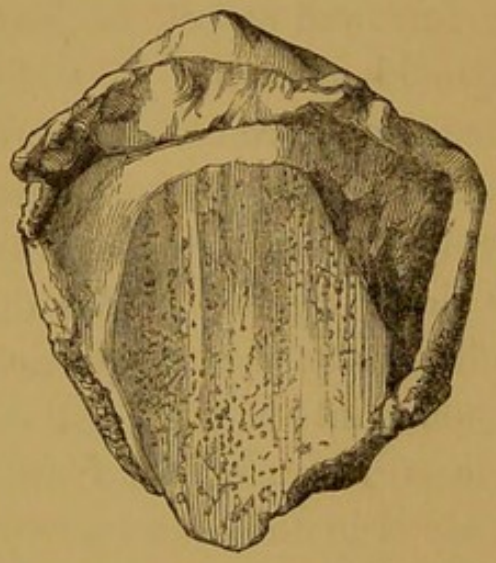
It is always in abundance where pressure is greatest, and, by presenting an even or furrowed aspect, facilitates enarthrodial, or secures ginglymoid motion. It will as readily clothe bone of new formation, as constitute a crust upon the original tissue. "L'état éburné des cartilages," writes Lobstein, "est manifestement un effet de l'arthritis; une fois produit, il détermine de la rigidité et des douleurs dans les articulations affectées et des craquements dans leur mouvements. Le poli dont je parle est sans doute l'effet du frottement; mais la substance éburnée résulte évidemment du dépôt de la matière osseuse qui a envahi et détruit les cartilages diarthrodiaux; ce qui la prouve c'est son exubérance autour des surfaces articulaires, auxquelles elle donne un rebord saillant."

"This change is effected," says Mr. Paget,* "by the formation of very imperfect bone,—of bone which has no well-formed corpuscles, and it resembles the result of mere calcareous degeneration rather than a genuine ossifying induration. And its character as a degeneration is further declared in this,—that it is prone to destructive perforating ulceration, which often gives a peculiar worm-eaten appearance to the bones thus diseased." In all the situations where the porcellaneous change has taken place, it is very

* Lectures on Surgical Pathology, vol. i. p. 406.

common to find the condition last alluded to by Mr. Paget. In Mr. Smith's work on Fractures and Dislocations will be found some fine illustrations of this peculiarity in the head of the thigh-bone. It is frequently seen, too, in the upper part of the head of the humerus which has become eburnated, as it plays against the under surface of the acromion process, and likewise in the patella and condyles of the femur when in the same state. The annexed sketch demonstrates this appearance in the patella, and shows likewise the presence in ginglymoid joints of the longitudinal ridges and furrows which become established in the movements of the bones upon one another.

Fig. 5.



I have much pleasure in acknowledging the characteristic kindness of Professor Quekett, who, a few years since, favoured me with the following interesting and original view respecting the formation of this ivory-like deposit :—" On removing some thin slices with a saw, and making them sufficiently thin for the microscope, I found that the bone was more than usually dense, and that there was an almost total absence of Haversian canals, which made the bone more dense : this led me to speculate on the cause of this porcellaneous deposit. Recollecting that the French-polisher (when he wishes to give a fine polish to rosewood, mahogany, or any other woods which have an open grain) first fills up the pores in the wood with some wax or resinous material, and then polishes, whereby a fine lustre is obtained, it at once struck me that

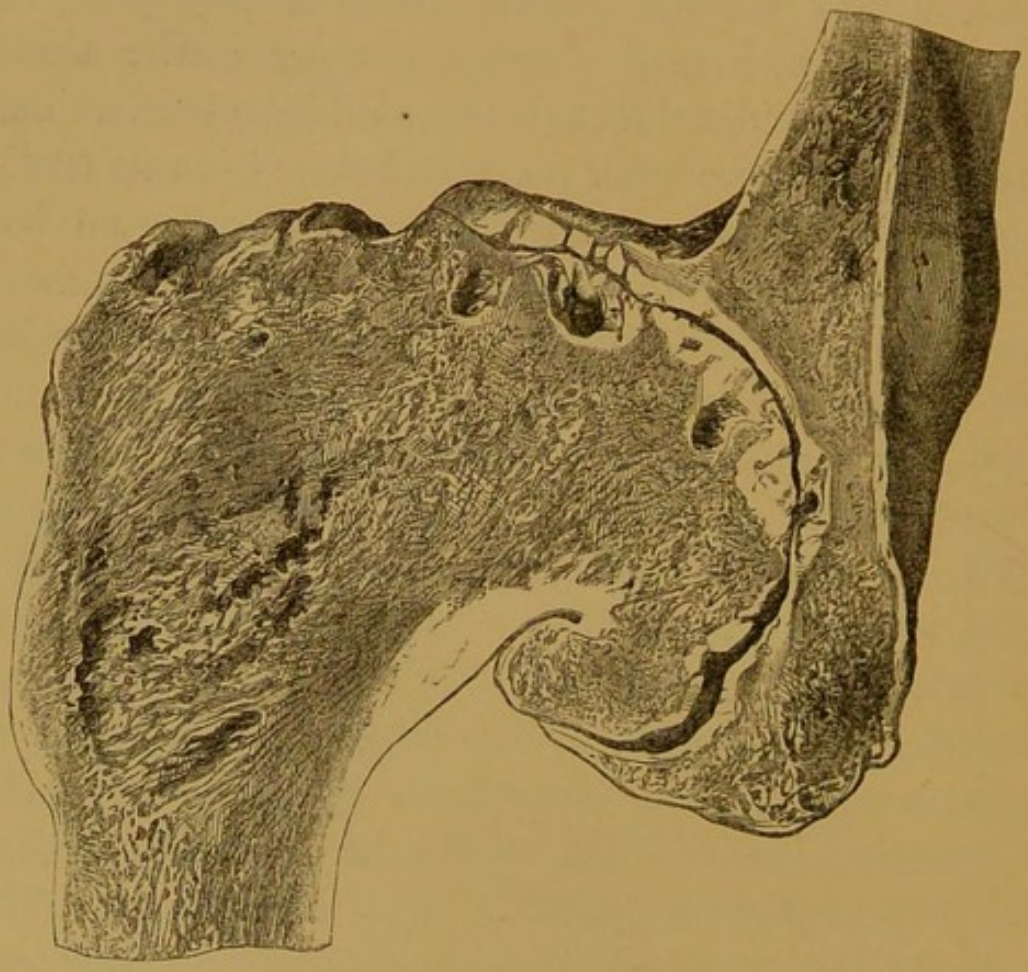
no bone would present this porcellaneous appearance without its canals were first filled up; and I then began to consider how this took place. In every bone which I examined, having this deposit upon its surface, I invariably found, in the immediate neighbourhood of the deposit, that there was an additional quantity of bony matter thrown out; and I considered that there would have been a similar growth upon all the other parts, had there been no friction of opposed surfaces in these places—the exuberant bone being kept down by the friction. The only other places in which new bone could be deposited were the canals, which were by this means filled up, and the bone rendered more dense in consequence, which dense bone being subjected to constant friction, became polished, and hence the cause of the so-called *porcellaneous deposit*."

On section of a recent bone whose surface has become eburnated, the cancellous interior will be seen to be strongly contrasted with the dense deposit enclosing it; and the opaque whiteness of the latter forms by its under surface an irregular line of limit to the here unduly reddened medullary membrane beneath. In some parts, the filling up of the Haversian canals has not occurred to any great depth; but in other places a large amount of new bone has been deposited. Many of these points will be illustrated by the drawing in the following page.

Enlargement of the articular ends.—I have already adverted to the opinion of Rokitansky upon this point, which, however, must give place to the more recent and correct views which Mr. W. Adams has advanced upon the subject. In a communication made to the Pathological Society of London by this latter authority, and which will be found in the third volume of their Transactions, Mr. Adams has shown that the encrusting cartilage becomes at first hypertrophied, and subsequently undergoes ossification, so that

new bone, in this manner, is superadded to the old. Whilst this change is in progress, a section of the parts

Fig. 6.



shows the ossification extending (Fig. 7) in such a way that there is a layer of cartilage covering in the new bone with a substratum of it existing between itself and the old bone. After a time, however, and when the ossific process has further advanced, the original and newly-formed bone become continuous, as the intervening substratum of cartilage disappears (Fig. 8).

The size and shape of the original bone may, in this way, be seen to have been maintained beneath these growths, which are hence to be looked upon as so many superadditions; and the so-called "enlargement of the articular ends" must be regarded as a fictitious appearance,

and in no manner due to an expansion of their osseous tissue.

Fig. 7.

Fig. 8.

Synovial membrane.—This is very commonly found thickened, unduly vascular, and presenting in situations close to the encrusting cartilage, groups of hypertrophied fringes or fimbriæ which are engorged with blood and project in part freely into the joint and are in part slightly adherent to its walls. These processes are very characteristic of chronic rheumatic arthritis, and may be seen in all the joints affected by the disease. Their origin and mode of formation has been explained by Mr. Rainey, in the Pathological Society's Transactions for the Session 1848-49, p. 110.

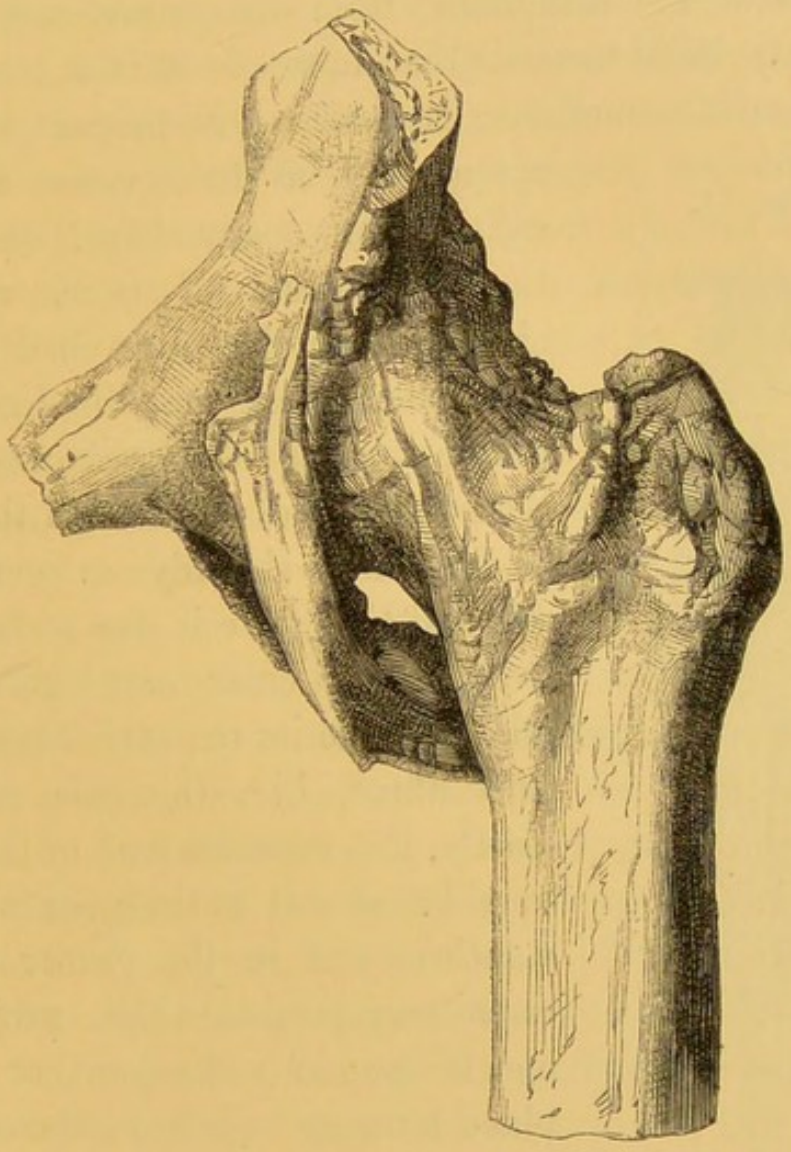
Fig. 9.

Fibrous structures.—A leading feature in these tissues is that in some parts we find them to have become absorbed, whilst in other situations they are impregnated, so to speak, with calcareous matter, which is often laid down so copiously as to form larger and smaller masses of spongy osteophytes of various forms, encroaching upon the joint and locking the parts of it so securely together as almost entirely to prevent movement. This is well seen in the knee-joint at Plates 1 and 2. The transverse and cotyloid ligaments of the acetabulum are commonly, in this affection, to be found bony. In one case of chronic rheumatic arthritis of the hip which I dissected, the united tendons of the psoas and iliacus muscles were replaced by bone, as seen in the annexed figure (fig. 10). Both sides were similarly circumstanced.

Another condition, I may mention, of these tendons, to be sometimes noticed, is that their under surface is divided into small packets, like those of the trochlear surface of the obdurator internus. This state, in two or three instances, I have seen obtaining in the tendon of the subscapularis.

With respect to the removal by absorption of fibrous textures, I may refer to the frequency with which the inter-articular ligament of the hip and the intra-capsular portion of the tendon of the biceps of the arm, disappear. It is very common, too, to find that the capsular ligament of the shoulder-joint has been removed at its upper part, as the head of the humerus presses upon it in passing upwards to articulate with the under surface of the acromion process when the long bicipital tendon has been removed. The margins of the opening not unfrequently become adherent to neighbouring bony processes, or the synovial membrane may freely communicate, through the aperture, with the subdeltoid bursa. Such appearances have often been described by eminent men as instances of lacerated

Fig. 10.



capsule, with torn tendon of the biceps. Their further description, however, of the remaining joint-textures, in these cases, whilst it has shown to others their own error, has confirmed for themselves, too, their own opinions. I must not omit to mention that the acromio-clavicular joint is often found opening into that of the shoulder in the advanced stage of the affection.

Whilst speaking of the fibrous textures of these diseased articulations, I would gladly devote yet more space to a consideration of the various appearances which the inter-

articular portion of the long tendon of the biceps so commonly presents. This part may be displaced, in the progress of the complaint, from its groove, and lie comparatively loose towards the inner side of the head of the humerus: it sometimes, in retaining its proper place, is so spread out as to become eventually split up into many strips, which shall be, in process of time, altogether absorbed, or the unravelled portions, as I have seen, may lie loosely over different parts of the humeral head. Again, the under surface of the tendon is frequently shreddy, as seen in Fig. 11, and this state is due to its playing over the articular cartilage beneath, which before its removal becomes split into fibres, like the pile of velvet. Lastly, this capsular part of the tendon may be almost entirely or altogether wanting, and in the former case the remaining portion shall project free and fringed into the joint, or its atrophied remains be found adherent to the bicipital groove of the humerus.

Fig. 11.

In the Medical Gazette, vol. xiv. a paper has been inserted, by Mr. Gregory Smith, entitled "Pathological Appearances in seven Cases of Injury to the Shoulder-joint." The specimens were met with in the dissecting-room, and their history could not be ascertained.

Capsular tendons.—In the first preparation, the tendons of the spinati, subscapularis, and lesser teres muscles, are described as having been completely detached or torn away from their connection to the tubercles. In the second case, the

tendon of the subscapularis was partially torn from the lesser tubercle; but the insertion of the spinati and teres minor muscles remained perfect. The third example was similar to the first; and the fourth displayed two of these muscles torn from the tubercle: the inner surface of the capsule presented a very rough fibrous appearance, occasioned by portions of the lacerated tendons. Cases VI. and VII. are, in respect of these tendons, analogous to the preceding ones.

The above appearances are frequently to be met with, more or less strongly pronounced, in well-marked cases of chronic rheumatic arthritis, and are to be seen associated with others in the articular surfaces of the humerus and scapula, the tendon of biceps, surrounding bony growths, ivory-like deposit, &c. which characterise the affection, and all of which are carefully described by Mr. Smith as having been present in his specimens. In tracing the cause of the rheumatic disease, and noting the various morbid changes it establishes in its progress, it is easy to comprehend how, from an absorption of the articular portion of the bicipital tendon and consequent displacement of the head of the humerus through the agency of the surrounding muscles, with the establishment, too, of new surfaces for the accommodation of the bone, that the tendons of the capsular muscles at their insertions should suffer atrophy from pressure, and present irregular, fringed, and apparently lacerated ends attached to and intermingling with those nodulated osseous growths which spring from the tubercles of the humerus and their vicinity in this complaint.

Tendon of the biceps.—In five cases this part is described as being torn through,—the lower portion being attached to the margin of the bicipital groove,—whilst the superior portion had either disappeared or was affixed to the upper part of the glenoid surface. In Cases VI. and VII. the tendon was not separated from its origin, but displaced

from its groove, and was lying loose in the inner part of the cavity of the joint: it is expanded, and bears evidence of having been subjected to pressure and friction. The bicipital groove is nearly obliterated, and portions of ossific matter have been deposited.

The author of the paper ascribed the appearances to the effects of dislocation of the humerus, either into the axilla, on to the dorsum scapulæ, or under the pectoral muscle.

Feeling fully persuaded that Mr. Smith had been mistaken in his interpretation of the pathological appearances which he so ably described, I wrote to him on the subject; and in submitting my own views of his specimens, inquired whether from subsequent experience he had not found reason to alter his opinion regarding the origin and nature of these morbid phenomena. I at once received such a reply as might be expected from one desirous only of establishing the truth, and unbiassed by preconceived notions. Mr. Smith says:—"I was, in the first instance, disposed to view the appearances as purely the result of injury; but the frequency of their occurrence, and their similarity, to a greater or less extent, to the apparent mischief, induced me, afterwards, to come to a different conclusion, and to view them rather as the *destructive results of long-continued chronic inflammation of fibrous tissues.* I am speaking entirely from recollection; but, as far as I can recall to memory, we became so familiar with the appearances, that we could often detect the morbid condition of the joint, before a close examination, by the alteration in the general form of the biceps muscles,—the outer head being very much smaller and shorter than usual. The subdeltoid bursa generally communicated with the shoulder-joint, &c. In two of the examples there was fracture of the acromion process about half an inch from

the articulation, which had formed the usual appearances of an artificial joint. In these instances all the structures under the deltoid muscle appeared to participate in the boundaries of the joint. It appeared to me as if some strong force had been acting to pull the humerus upwards, as by strong contraction of the deltoid muscle, continued for a length of time."

Mr Soden, of Bath, has published in the Med.-Chir. Trans. for 1841, a case in which the long tendon of the biceps was dislocated inwards, from accident, and the head of the humerus, consequently, upwards: and he refers to Mr. Smith's cases in support of his position that:— "*rupture* of the tendon of the biceps would appear to be no uncommon accident, for its occurrence both separately and in combination with *dislocation* of the bone has been several times noticed." Mr. Adams, of Dublin, has completely disproved the views held by Mr. Soden of his case, in a communication made, a year or two since, to the Pathological Society, whereat he exhibited two specimens of chronic rheumatic arthritis of the shoulder-joint, removed from one subject, in both of which the bicipital tendon was displaced inwards, and in the absence of any injury having been inflicted on the articulations. The appearances within the joints and around them were, besides, such as are so commonly seen in the rheumatic affection — such, too, as Mr. Soden's case also displayed. True it is, that applied violence may light up the mischief, and incite the various morbid changes, equally as it is known to produce them in the hip; but the accounts of specimens, such as I have referred to, besides others which have fallen under the notice of Mr. Smith, of Dublin, and myself, should make us wary in considering the abnormal appearances to be the *immediate* result of the injury done to the articulation.

It is not a little surprising that error has so frequently been committed in respect to the pathological conditions I have been considering, and that surgeons will still persist in describing specimens of dislocation of the humerus upward, with laceration or displacement of the biceps and neighbouring tendons, together with a torn capsular ligament, &c., when a little study of the phenomena of chronic rheumatic arthritis during life, and an examination of the morbid states to be found after death, would soon dissipate those false notions which have been often promulgated by the highest authorities (on other subjects) in respect to these, as they state them, the *effects of injury*, and which notions have been, almost without an exception, derived from instances which had fallen, after death, casually under their notice, and in the absence, too, of any knowledge whatever of the subjects of the affection during life. I may add that in future instances it would be well to have described, together with the changes wrought in the shoulders, those which will be found, in all probability, in some other near or more distant joints of the body. This would assist towards other and more feasible conclusions than those so often hastily and erroneously arrived at.

Before quitting this department of the subject, I would adduce, in further illustration of the above remarks, the particulars of a case of chronic rheumatic arthritis of the shoulder-joint which I placed on record seven years ago :— the patient was then living, but three years only had elapsed before the opportunity occurred to me of examining the affected parts; and it will be seen from the account which I am now enabled to offer of the *post-mortem* appearances, that they are similar to those which have frequently been described as originating in accident which had caused a dislocation of the head of the humerus upwards, with rupture of the bicipital tendon and laceration of the

capsular ligament; whereas, no outward injury had been inflicted, though the joint had suffered materially from the inward violence of the rheumatic leaven.

Case.—James Harrison, æt. 78. The patient, a tall, emaciated and feeble man, who for many years has been labouring under a large scrotal hernia combined with hydrocele on one side and an equally large femoral rupture on the other, states that in the year 1805 he "got thoroughly wet through," and the next morning suffered from rheumatism of the right shoulder, but in no other part. This was the first attack of the complaint he had experienced, and for which he was attended by Dr. Hope, of Edinburgh. The treatment adopted relieved him in a short space of time. From this period to the winter of 1847, the joint remained free from any uneasiness, except in damp or frosty weather, when a "sensation of gnawing" was complained of in the part, and continued to trouble him whilst the inclement weather lasted. This trouble, however, has not been of a nature to prevent him following his usual work, that of a gentleman's servant. In unfavourable weather the pain was always aggravated at night, or, as he says, "when warm in bed." In the winter of 1826, whilst employed in dislodging snow from a house-top, he caught a violent cold, through getting his feet wet, and from that time the left hip has been affected with rheumatic pains, which, like those of the shoulder, are found to be invariably increased in frosty or damp weather, and when in bed. The pain was always especially felt "the first thing in the morning," whilst a sensation of cracking and grating was frequently complained of; at the same time the sound emitted, particularly when rising from a sitting posture, has been audible to, and remarked upon by the bystanders. Nine or ten years ago he became a patient for the hip complaint, in the Middlesex Hospital, under

the care of Mr. Arnott. Various applications were employed and medicines administered, without relief; and at the expiration of a month, the nature of the disease and its intractable character having been explained to him he quitted the hospital. At this time he walked lame, and was informed, after admeasurement of the limbs being made, that the left leg was shorter than the right one. At present no great difference is to be noticed, inasmuch as the opposite hip has become equally affected.

To return to the shoulder. No distinct attack of rheumatism occurred to it since the one above mentioned; but it has continued to be the seat of the same symptoms as those previously described during the last twelve months. On applying a hand over the joint, then circumducting and rotating the humerus, a very well-marked *articular crepitus* is heard, and the peculiar sensation characteristic of it also is communicated. The crepitus is likewise readily felt when, in circumduction, the arm passes forward from the side of the chest, this movement producing, at the same time, an indescribable uneasiness in the articulation. Pressure on the deltoid muscle, or such as approximates closely the joint-surfaces of the humerus and scapula, gives no pain, nor is any inconvenience felt when the head of the humerus is directed against the under part of the acromion process. The arm can with difficulty be elevated, or directed forwards or backwards. The deltoid of either side, in common with the muscles generally, is wasted; little, if any, difference is to be noticed, however, between the two sides. Measurement does not show the right humerus to be nearer the acromion process than it is on the left side.

An incessant dull pain, aggravated by motion, is complained of in the joint, and extending thence down the front and along the inner side of the arm to the elbow.

The acromio-clavicular articulation presents a partial dislocation of the clavicle, which is elevated, and appears to be fixed near the upper edge of the articular surface of the acromion process. This joint of the opposite side is, in all respects, normal.

Post-mortem appearances. Bones.— The head of the humerus appears enlarged, with its articular surface flattened and prolonged downwards by a spongy, osseous rim of bone, which overhangs the anatomical neck (similar to that seen at Fig. 2). The encrusting cartilage is in some portions frayed out, and in others perfect; but at the upper part it is entirely wanting, and replaced by a porcellaneous polish to the extent of a space which a florin would cover, and which presents numerous large and small foramina. Many osteophytic growths encumber the tubercles, and the bicipital groove is obliterated by bone except at the superior portion. The glenoid cavity of the scapula is increased in breadth, and has at its lower part an ossific projection corresponding to that on the head of the humerus. The under surface of the acromion process is eburnated, and accords with that part of the humerus which is in a similar state, and which, indeed, had played upon it. *The synovial membrane* is thickened, and in some places very vascular, especially so where it presents numerous engorged and hypertrophied fimbriæ. The synovia is thick and abundant. A large bursa mucosa exists between the capsular ligament and the outer side of the coracoid process. *Fibrous tissues.* —The capsule adheres to the margins of the eburnated surface at the under part of the acromion process, and the acromio-clavicular joint, just external to it, opens into the cavity of the articulation; the subdeltoid bursa is in free communication with the synovial membrane through a large aperture in the capsule. The under surface of the subscapularis tendon is divided into several flattened and distinct

bands, and the tendons of the spinati muscles and teres minor are irregular—in part absorbed, and in part mixed in with the osteophytes already spoken of; the tendon of the biceps is all wanting, except a small part below, which lies freely in the joint, with a fringed extremity. There is rather a large amount of fat between the fibres of the *muscles*, and in some parts these fibres have suffered from fatty degeneration.

Hands and Feet.—Fig. 3, Plate III., will give a very good idea of the extent to which the hand may suffer in this complaint. In such a case its functions are entirely abrogated; and in this instance the patient—a female eighty-eight years of age—was likewise afflicted with the same form of malady in both shoulders, knees, and the spine.

This condition of the hand was first particularly described by Dr. Haygarth, in the year 1805, under the name of "nodosity of the joints." He says: "As the disease increases the joints become distorted, and perhaps, in bad inveterate cases, even dislocated. The skin seldom or never inflames." The author has more frequently seen the complaint in the hand than elsewhere. Out of thirty-four cases, only one was in a male: all the patients (two excepted) were above 41 years, and the most common date of the commencement of the disease was between 51 and 60 years. A close connection has been, curiously enough, traced between the occurrence of the malady and the cessation of the menses; and it is stated, "in some the nodes appeared as soon as the menses became irregular,—most commonly at the time when they ceased, and in a few instances several years after this period."

Of all the hand-joints, the first carpo-metacarpal isthe one which I have seen to be the most extensively affected. Previous to dissection, the joint commonly presents—as seen in the annexed drawing—all the characters of a partial

PLATE III.

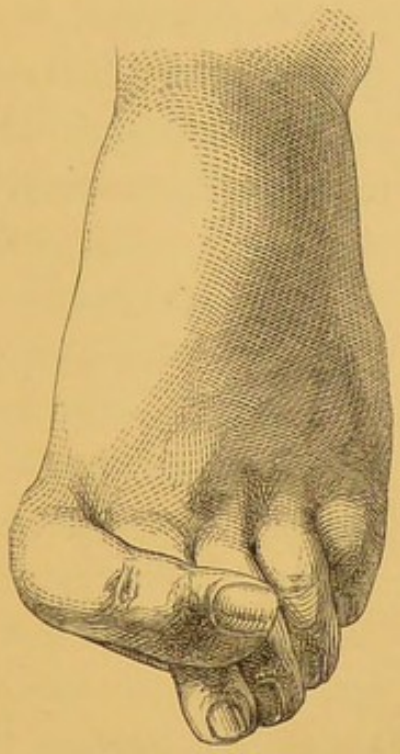


Fig.1

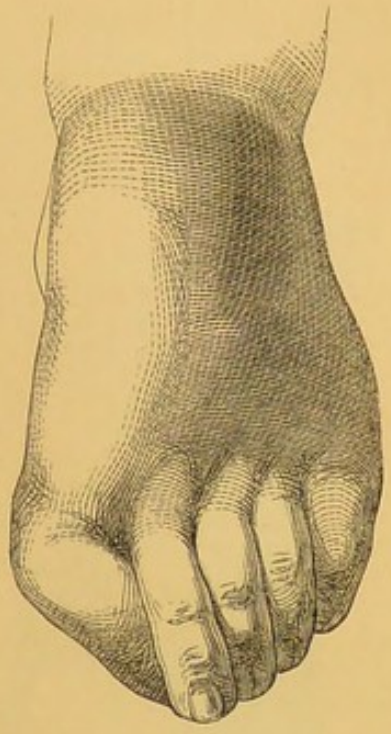


Fig.2

Fig.3

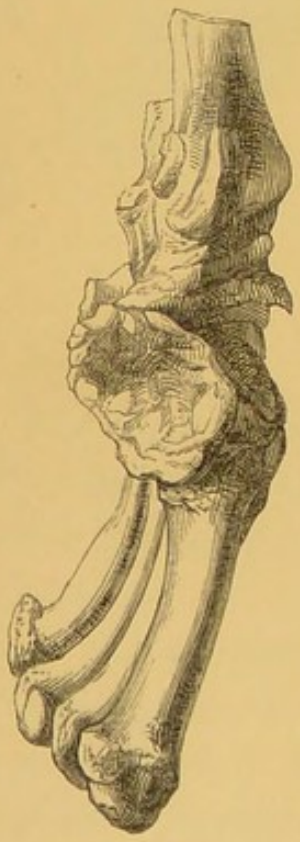
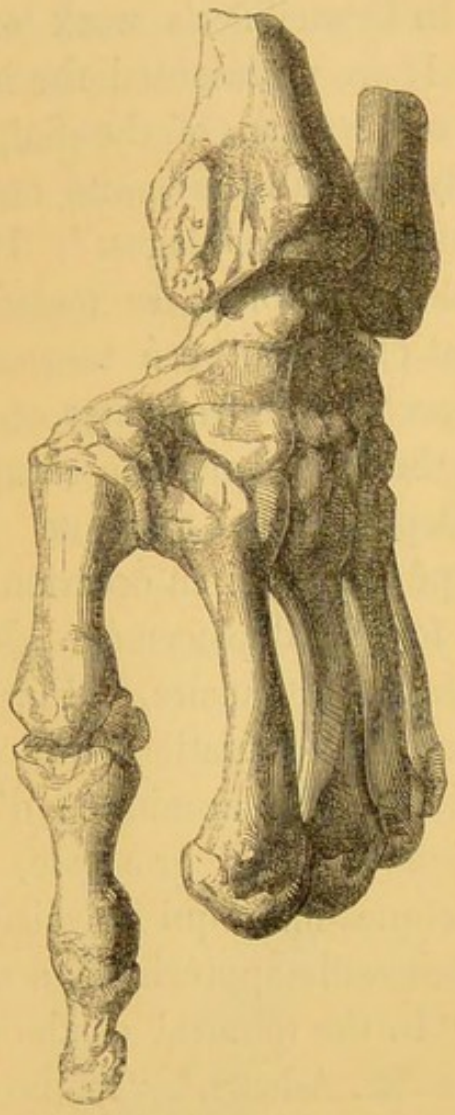


Fig.4

Fig. 12.



dislocation upwards of the first bone of the thumb from the trapezium. The former can be readily drawn downwards, but in the absence of traction resumes its former position. In one such example (Plate III. Fig. 4) I found the ligaments dense but lax, the synovia thick and plentiful, the trapezium hollowed out to the depth of half an inch, with its upper margin projecting greatly beyond the level of the lower one, and the interval between the two was an inch. The cartilage was almost entirely absent, and minute apertures are to be seen in the exposed bone, the scabrous and irregular edge of which is here and there studded with osseous nodules. The upper end of the first metacarpal bone is conversely adapted to these peculiarities. In the two succeeding joints similar, though slighter, evidences of the disease are to be seen.

In the early stage of the complaint, the portion of cartilage encrusting the lower and inner part of the articular surfaces is the first to disappear; and I have several times noticed that where enamel-like deposit has occupied its place, the movements of the thumb have been restricted to adduction and abduction, in consequence of the ridges and grooves which the surfaces present.

The furrowed condition is by no means unusual in the phalangeal joints.

In Cruveilhier's work on Morbid Anatomy, livr. xxxiv. pl. 1, are represented the hand, and dissections of it, from an old woman of the Salpêtrière. There is great deformity, and all the joints are affected with what is termed "usure des cartilages." It is remarked of the case—"La malade attribuait sa maladie à un rheumatisme goutteux, dont elle aurait été tourmentée dès sa jeunesse." With respect to the frequency of the occurrence of this complaint in the hand, and the cause of it, the author observes:—"Depuis sept ans que je pratique la médecine à la Salpêtrière, j'ai eu occasion de voir un assez grand nombre de fois le déplacement des phalanges consécutif à une maladie articulaire. Plusieurs des femmes qui présentaient des altérations avaient été soumises à l'influence du froid et de l'humidité: d'autres faisaient remonter cette lésion à une grossesse, à un *rheumatisme laiteux*. Quelques-unes qui n'avaient subi l'action d'aucune cause occasionelle appréciable, accusaient la *goutte*."

"In the removal of the cartilage without suppuration," says Mr. Adams,* "in the substitution for it of porcelain-like deposit, and in the surrounding exuberance of new bone, we find this disease of nodosity of the joints of the fingers resembling accurately the analogous affection of the other joints, which has been supposed to be the slow effects of chronic rheumatism."

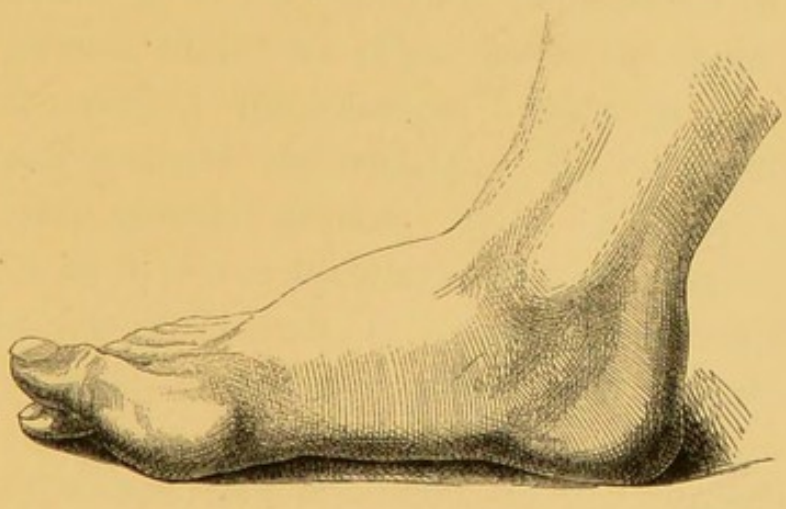
Feet.—Though the joints of the foot may suffer in the manner just described, they are, nevertheless, far more unfrequently affected than those of the hand, and the malady is very commonly restricted to the articulations of the great toe, and I would say is, for the most part, especially pronounced in that formed by its metatarsal

* Cyclop. of Anat. and Physiol. art. Hand.

bone and first phalanx. The ordinary positions assumed are those seen at Figs. 1 and 2, Plate III. The anatomical characters of the joints, when the hand is the subject of the complaint, are closely repeated in the foot; and we very usually find developed a large, thick-walled, subcutaneous bursa, or bunion, on the inner side of the "ball" of the great toe.

In Nov. 1850, Mr. Coulson brought before the Fellows of the Medical Society of London some cases exactly similar to those now under consideration. They were described as "dislocations of the distal extremity of the great toe;" and an account of them was subsequently published in The Lancet of the above date, accompanied by illustrations, of one of which the subjoined is a copy.

Fig. 13.



The details which Mr. Coulson has given of the diseased appearances agree in all particulars with those which I have very often met with in these cases,—appearances which are perfectly characteristic of the rheumatic affection we are noticing; and though Mr. Coulson has ably described "the synovial membrane breaking up, and in a great degree disappearing; the cartilages becoming

thinner, and gradually disappearing; lastly, the extremities of both bones, which were encrusted with cartilage, acquiring an ivory surface," &c., he has failed to recognise the affection as an instance simply of chronic rheumatic arthritis, and describes it rather as a malady *per se*. The other joints of the body should have been examined, and I doubt not that marks of this complaint would have been readily recognised in some of them. For myself, I may state that in the numerous examples which I have dissected, I have never failed to find such corroborative evidence; and, in the cases which I have figured, chronic rheumatic arthritis existed in the hands, knees, shoulders, and spine.

ON

SHORTENING OF THE LEG FROM BRUISE OF THE HIP.*

The injury in early life. — We possess no data on which to found an opinion as to the probability, in any given case, of the limb becoming shortened from *interstitial absorption*† *of the neck of the thigh-bone* after contusion of the hip in a comparatively young subject. Either sex may experience this result: no peculiarity of constitution is to be detected as constantly present in these cases: blows on other bones or joints are not followed by such a phenomenon: early or late in life, atrophy may succeed the violence: the shortening may increase with greater or less speed, and the gradual, insidious, and, in some instances, almost complete removal of the cervix femoris, is accomplished without any appreciable signs of inflammation,—without any general

* "Enfin je soupçonne que dans certain cas où on a observé la raccourcissement chronique du membre, dans ces circonstances où les signes de la fracture avaient été equivoques, il n'y point eu fracture du col, mais que le col a subi une violence qui y a determine des altérations organiques de nature diverse par suite desquelles s'est operée une resorption ulterieure."—*Chassignac.*

† *Interstitial absorption.* "The removal of parts from within the very substance of the tissues, as distinguished from the removal by ejection of particles from the surface, of which I shall afterwards speak as occurring in *ulceration*" (*ulcerative absorption*).—*Lectures on Surgical Pathology*, by J. Paget, F.R.S.

affection of the system, and in the absence too, it may be, of any great amount of local inconvenience. The commencement of shortening may date from the time of the accident, or occur some weeks or months subsequently. Mr. B. Bell attended a lady in 1825 who could walk with assistance a few days after the accident. In this case the limb was shortened to the extent of an inch in the course of ten months after the injury.

It is important that we should always bear in mind that interstitial absorption may supervene upon bruise of the hip, for blame by patient and friends is readily cast upon the medical man who has, originally, pronounced the inflicted violence to be a matter of no further moment than to require, but for a short time, rest and local applications to relieve its consequences; and who has been unaware, or neglected to state, that such an apparently trivial injury entails, in some instances, incurable lameness.

Beyond this a grave error in diagnosis is believed to have been committed, for a fracture of, or close to the neck of the thigh-bone, or a dislocation, is presumed to have been overlooked, and those measures necessary for maintaining coaptation or effecting reduction neglected, which otherwise might, by their employment, have secured the former length and utility of the limb. That such an error should be made, however, is by no means probable, for the accident is unaccompanied by a single symptom characteristic of the fracture or luxation: the result of the case, nevertheless, might expose the reputation of the unguarded practitioner in attendance to an imputation of ignorance raised by uninformed or interested persons; whilst the evidence of apparent mistake presented by the *sequelæ* of the case gives a strong, though false, colouring to the justice of the charge.

An acquaintance with cases of this description is valuable also, I believe, as the disease during its progress might otherwise be confounded with that more serious and often intractable affection, morbus coxarius; this latter complaint leading, not unfrequently, to total disorganization of the joint and anchylosis, or terminating in death: the former being an affection unconnected, except incidentally, with the strumous diathesis, and ending in the loss of the cervix femoris without producing any constitutional disturbance,—without the establishment of ulcerative absorption, and the formation of matter,—involving, to a variable extent, the head of the bone and the acetabulum, but not affecting, eventually, to any great degree, the range of motion.

I have been unable to find the *details* of any cases in which the neck of the thigh-bone has suffered this peculiar affection in young subjects, as a consequence of injury inflicted, with the exception of those so well described by Mr. Gulliver.* The complaint at this period of life is acknowledged to occur occasionally from violence: but with the belief that it is not so generally known as it should be, I have been led to pen this article.

Occasional allusion is made by a few authors only to the effect of this accident in comparatively young persons, as in the following abstract from Mr. B. Bell's work.† "I have met with cases in which interstitial absorption had affected the neck of the thigh-bone of one side in persons of thirteen, thirty, and forty years of age. In cases which occur in middle age, it does not in general appear to be an idiopathic affection, but is the direct result of injury of the trochanter major."

The subjects of the complaint who fell under the notice

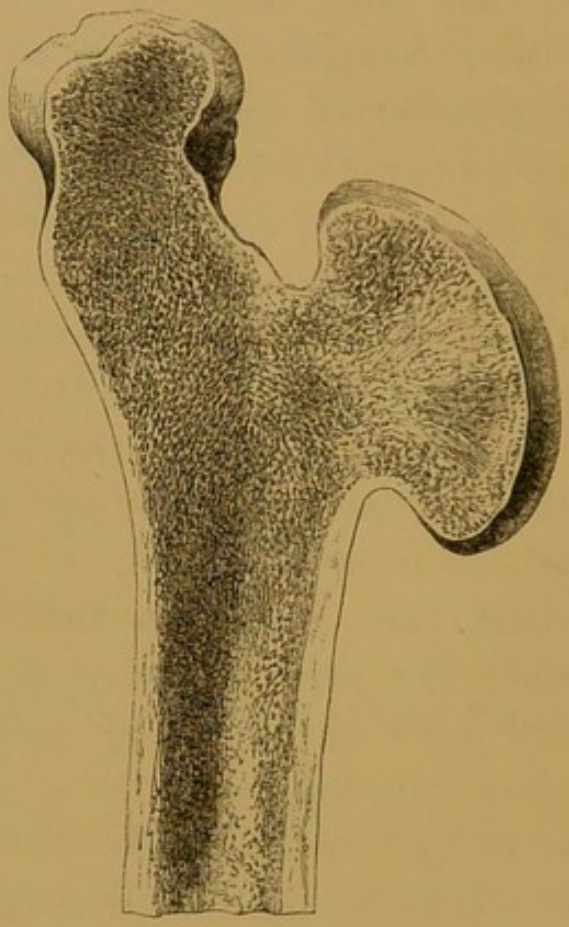
* Edin. Med. and Surg. Journal, vol. xlvi.

† Diseases of the Bones, 1828.

of Mr. Gulliver were all males, of the respective ages of fifteen, nineteen, thirty, thirty-two, and forty-five years.

The annexed illustration is copied from one given by Mr. Gulliver in the paper above referred to.

Fig. 14.



The following case, through the kindness of Dr. Bainbridge, surgeon to St. Martin's Workhouse, I have had the opportunity of watching for many months, and of which I have made the subjoined notes.

Case I. — Mary Betton, ætat. 19, is of strumous diathesis, hysterical, menstruates with irregularity, and is subject to a confined state of the bowels. In March 1847, whilst carrying a can up stairs, she missed her footing, and caught her ankle between two rails. She fell down three steps, striking at the same time the left trochanter major and left leg: the latter continued to be swollen and tender in consequence for two or three weeks. There was slight diffused ecchymosis over the outer part of the injured hip accompanied by some swelling, and general soreness was felt there for several weeks, obliging her to keep in bed. The least movement of the joint gave her great pain, which she describes to have been of a sharp, shooting character, extending down the inner side of the thigh to the knee.

She has always enjoyed good health until three years ago, when she was knocked down by a cab; the ribs were broken, and the abdomen bruised, but neither hip was hurt. Since this period, she has had frequent attacks of erysipelas in various parts of the body; has suffered from strumous ophthalmia, eruptions on the face, and has been, as she says "altogether out of health ever since."

For the injury to the hip she was confined to her bed for three months, during which time there was felt a constant pain in the joint, aggravated almost invariably at night, and always by moving the limb. Liniments and fomentations were frequently, but uselessly, employed. At the expiration of the time mentioned, on quitting the bed and endeavouring to move about, she found that the left leg was shorter than its fellow, occasioning her consequently to limp in walking. The amount of shortening was not then ascertained, but it has from that period to the present been on the increase. The pain is worse at night, and augmented in damp weather; aggravated on motion, and slightly so by pressing the heel upward, or the trochanter inwards.

Throbbing pain is also complained of at the inner side of the knee, but only when the hip is moved. The former joint is free from swelling, redness, or tenderness on pressure, and its range of motion is perfect. She is unable to approximate the left leg closely to the right one, or to abduct and extend the left thigh, without increasing the pain, which does not, under any of these circumstances, appear to be of a severe character. Flexion at the hip is unattended by inconvenience. In progression the left foot is thrown somewhat forward, with the heel elevated, and in standing or walking the toes of the left foot support, in part, the weight of the body. The sole cannot be brought

to the ground without a slight inclination of the body to the left side.

On examining the patient, placed in the horizontal position, the body and limbs are seen to be well formed, and there is but little muscular wasting of the left side of the nates perceptible. There is an absence of redness over or in the neighbourhood of the hip, and no undue heat is to be felt there. The left heel is found to be at least an inch and a half above the level of the right one. The distance between the anterior superior spine of the ilium and the upper edge of the great trochanter is less by three quarters of an inch than that on the sound side. The trochanter is shown to be much nearer than natural to the head of the bone, by comparative measurement, on passing a tape from the centre of the pubes to the fissure of the nates, so as to include this part of the femur.

The patient states that she has never suffered from rheumatism.

The injury in advanced years.—If the neck of the thigh-bone of an elderly person be examined, a particular change is often to be noticed in its direction, and in place of finding it set on to the shaft at the usual angle, it will be seen to have assumed a position more or less inclining to the horizontal one. This alteration, however, I believe, ought not to be regarded as of such invariable occurrence, or as happening to such an extent in the aged as is usually supposed; and I have been at some trouble to satisfy myself on this head by the inspection of the part in numerous subjects, whose ages ranged between sixty and ninety years. "I would venture to suggest, that those who have the opportunity should examine the state of this part in relation to the later periods of life, so as to enable us to distinguish between what has been considered as

connatural with old age, and that which may be regarded as the *effect of disease*."* Since my attention has been drawn to this subject, I have had frequent occasion to profit by this invaluable advice in post-mortem inquiry, and to be satisfied that many specimens which might be regarded as strikingly illustrative of senile atrophy with change in the direction of the cervix femoris are, virtually, examples only of an alteration occurring in connection with the disease, *chronic rheumatic arthritis*, which presents, in addition, even in an early stage of its progress, certain morbid appearances which will, I believe, when duly attended to, point clearly to the true character of the change. There is, nevertheless, a certain condition of the neck of the femur present after the age of fifty, which predisposes not unfrequently to great alteration in it upon the application of violence, and this is particularly well shown by what ensues when the part is fractured wholly within the capsular ligament: the absorbents then become busy agents in the removal of the cervix, and in the course of a few weeks only may have completely accomplished their work. This may occur even when, prior to the fracture, no change in the direction of the neck had been present. I examined lately an intra-capsular fracture which befell a female, aged sixty, two months after the injury, and found the cervix had wholly disappeared, whereas, on the opposite side of the body, this part presented the obliquity natural to an adult bone. This case would, I doubt not, frequently find its parallel if, after death, both joints are examined, in place of its being taken for granted that, from the age of the patient, an almost horizontal direction of the neck existed as a predisposing cause of the subsequent mischief. Mr. Howship has described a case in which

* Gulliver, loc. cit.

the neck had lost half an inch of its length by absorption on the third week after the accident. Illustrations of the fact are in most museums.

Where the head and neck of the femur, however, suffer concussion only, in consequence of a smart blow upon the trochanter major,—where, indeed, these parts are submitted to a momentary compressing force passing between the trochanter major and the opposite point of resistance, the same change is liable to take place as that just described, and is one which is very generally taken into account as being possible and not improbable in forming a prognosis of the accident. If the cervix be already inclining to the horizontal direction,—if the patient be bed-ridden,—if a female be the sufferer, or if a rheumatic diathesis be present,—the probability is in each case, I imagine, increased of the supervention of interstitial absorption upon violence applied to the trochanter of a person who has passed the age of fifty years.

"The numerous pathological inquiries which have been instituted in reference to the condition of the neck of the femur, seem clearly to indicate two facts,—1st, that this portion of the bone is less capable of maintaining its vascularity than the other parts of the osseous system; and secondly, that the universal decay of bone natural to advanced age first commences in it."* These interesting facts appear to me to bear upon the subject under consideration thus: if violence be applied in a particular direction, producing, probably, rupture or contusion of some of the nutrient vessels passing along the ligamentum teres for the head and cervix femoris, the quantity of blood supplied to these parts being thereby lessened, becomes still more inadequate to compete in the work of deposition against the

* Mr. B. Curling, loc. cit

opposing absorption which is already assuming the mastery, and the neck of the femur, naturally less capable of maintaining its vascularity than the other parts of the osseous system, falls a prey, so to speak, in the unequal struggle, and is slowly but surely destroyed; whilst the universal decay of bone coincident with life's decline here first committing its ravages, adds a potent influence in determining the issue.

The idea that at the time of the accident some vessels of the round ligament probably suffer, is strengthened by the post-mortem appearances described by Mr. Gulliver in the case of McGruth, wherein the capsular ligament appeared uninjured, but the round ligament had apparently been detached from the head of the bone, to which it had acquired a new connection near its original site.

The following history I have copied *verbatim* from the case-book of the late Mr. Howship :—

Case II.—July 23rd, 1828. Mary Hyde, ætat. 72. In the hard winter, fifteen years ago, she fell with the upper part of the right thigh on the pavement, raised herself by the railings, but fell a second time on the same thigh, which felt benumbed, and for some time she lay lame and helpless. It took her two hours to go on foot from Sackville Street to Bond Street. The leg, she observed, was first turned outwards, and is so still. About a month after the accident, she was able to crawl with a stick, and came into the Oxford Ward, St. George's Infirmary, under Mr. Heaviside. For many weeks the hip was fomented, with partial relief. She went out, carried in a coach. She was very weak, and the right limb was getting shorter, but she is quite sure that since the accident there has been gradual shortening, and especially within the last twelve months. In walking, it appeared to me that the limb was *shortened full two inches*, and this accorded with

her own idea. There is pain in the articulation of the hip-bone in standing on it, as if she had been struck a blow; aching and throbbing when fatigued, but always feels it: if she walks across the room it is slightly benumbed, or as if there was no strength in the bone. If exposed to fatigue, all the distress is in the neck of the femur.

On examination by measuring with a tape from the bottom of the heel to the anterior superior spine of the ilium, the right thigh is shorter than the left very nearly two inches: the trochanter seems enlarged, but is much higher up than on the opposite side; but the motions of the head of the bone prove this part in its place, but the neck appears exceedingly shortened, and I think changed in its direction.

June 1831.—Examined her again: able to walk very comfortably: no pain in bearing her weight, only an inconvenience from shortening.

January 30th, 1832.—After an insensible decline, sunk and died.

On removal of the right hip, I found the neck of the bone so shortened, that the margin of the head (directly behind which the capsule was attached all round), was brought nearly into contact with the two trochanters. A narrow, very small cord (the remains of the ligamentum teres), of its proper substance and appearance, yet existed, and in the space usually filled at the bottom of the acetabulum I found two very red and vascular masses of bone, partially covered with cartilage,—apparently an ossification of the fatty substance.

I shall venture to describe somewhat more in detail the bony parts of the hip, which are preserved in the Museum attached to the Charing Cross Hospital, (Plate 4, figs. 1 and 2). Less than half an inch of the femur remains below, whilst the upper part has suffered still more in the destruction, and is encroached upon and overhung by a

PLATE IV.

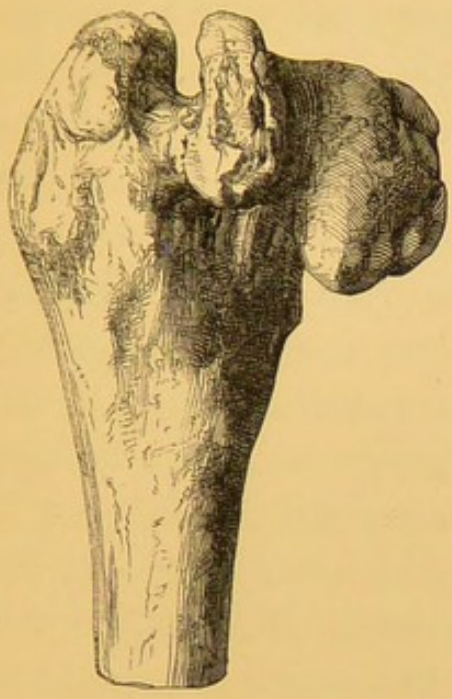


Fig. 1

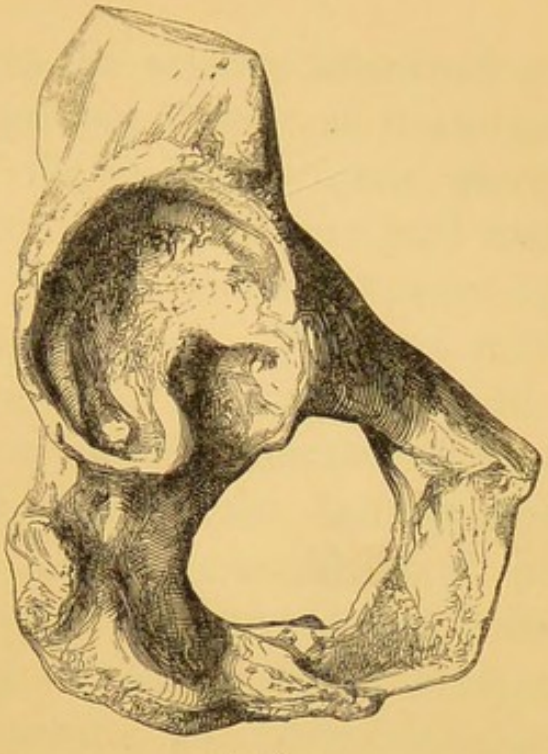


Fig. 2

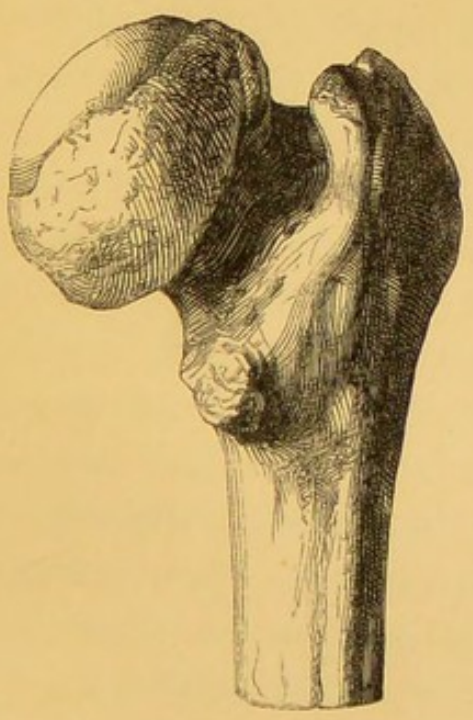


Fig. 3

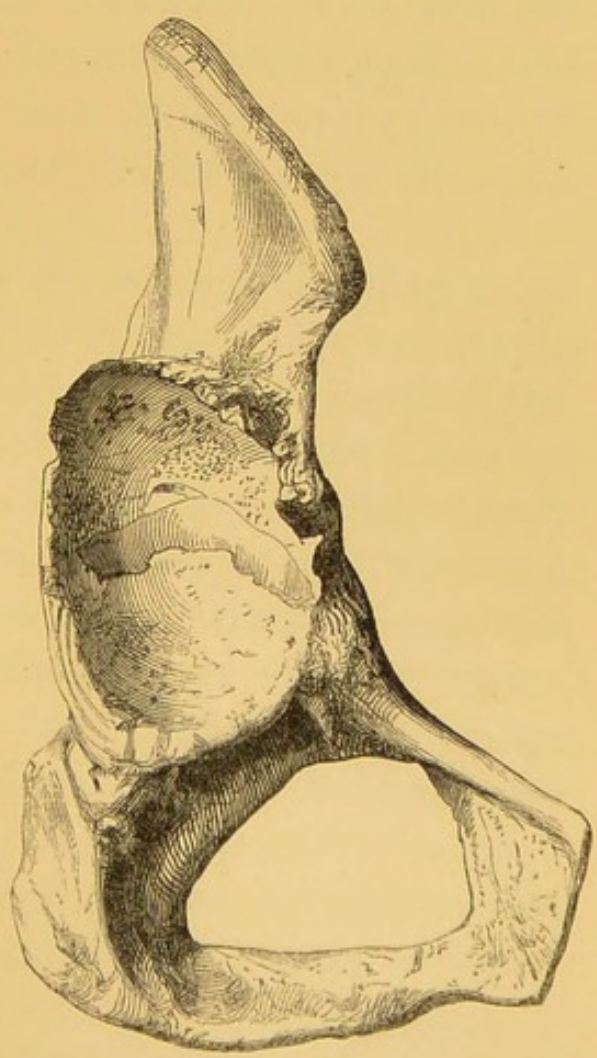


Fig. 4

buttress of bone springing from the anterior inter-trochanteric line, and gradually becoming thinner as it sweeps round and marks the limit of the head at its upper, posterior, and lateral margins. This projection is on a level with the summit of, and separated from the trochanter major by a distance of a quarter of an inch, only. The head itself is depressed, spread out so as to be $2\frac{1}{2}$ inches in breadth, and in height 3 inches, preserving still a certain degree of convexity, and overhangs, to concealment, the remains of the neck of the bone, so that the resemblance of the two to a mushroom with a thick and stunted stem is far from fanciful. The encrusting cartilage is absent in many places, leaving porous bone exposed. The whole bone, like the corresponding os innominatum, is light and spongy, but firm withal. The acetabulum is widened, and corresponds in breadth and height with the measurement given. The cartilage is here wanting in places opposite to the like deficiencies on the head of the femur. The width of the notch is $1\frac{3}{8}$ inches.

I have already shown that the changes occurring in the neck of the femur incidental to advanced age are not to be confounded with the alterations which ensue from violence or disease, and the statements of authors I find not unfrequently to be such as to warrant the idea that there is little if any difference in these affections: *e. g.* Professor Miller* says, "In consequence of external violence, as a smart blow or fall on the trochanter major, it is not uncommon to find the neck of the femur undergo much change by interstitial absorption: and *similar alteration may occur spontaneously*—that is, without any assignable cause,—seeming to be *one of the signs of the frame's decay, not only in mass but in details, which usually accompany old age.*"

* Principles of Surgery, 1844.

Analogous alterations from disease.—It is interesting to remark how similar are the morbid changes in the hip, consequent upon this injury, to those seen in *chronic rheumatic arthritis*: the same absorption of the neck, giving rise, in part, to shortening of the limb; removal of cartilage; eburnation of the exposed surface where pressure is greatest; flattening and depression with apparent expansion of the head, which has set on to it generally an irregular and overhanging crown, where it joins the cervix; enlargement of the acetabulum; disappearance of the ligamentum teres with thickening of the capsule, and irregular deposits of new bone around, are to be noticed; loose cartilages also may be found in the joint, and the transverse ligament be converted into a bridge of bone, &c. Such changes I believe have not unfrequently been regarded (in the absence of a history of the case) as aggravated examples merely of that atrophy of the part natural to declining years. In the examinations I have myself made of the hip in a large number of subjects (male and female), who have lived upwards of sixty, seventy, and eighty years, I have never been able to find any other alteration than a descent of the cervix, and that to a much less degree than I had imagined would be found at this period of life, from the description so commonly given by authors of the *horizontal* position of the neck of the femur which they consider as characterising the bone in an elderly person.*

I should mention, in addition, that a thinness of the

* Age affects the shape of the femur as of the other bones. The angle which the neck forms with the shaft is greatly altered, becoming almost a right angle.—*Manual of Anatomy:* Dr. Knox.

The neck is short in the child, long and oblique in the adult male: it is shorter and more horizontal in the female, forming nearly a right angle with the shaft: in old age also it often becomes shortened and depressed by interstitial absorption, so that the head sometimes sinks

cortex of this part, and a more open condition of the cancelli, was usually to be noticed. In three female subjects, each more than ninety years of age, I found the cervix but little altered from its natural obliquity. I have occasionally, however, met with a hip-joint (and as a very common rule, both sides had suffered), where the morbid changes previously alluded to were present: whilst the existence, ordinarily, of analogous alterations in some other articulations would additionally indicate, though such corroboration is needless, the real nature of the affection.

Mr. Adams, in his account of the rheumatic disease of the hip, has, in the subjoined remark, hinted at the simi-

below the level of the great trochanter, and becomes nearly contiguous to the shaft.—*Dublin Dissector:* Dr. Harrison.

The neck forms an obtuse angle with the body of the femur *(angle of the femur)* the degree of which varies in different individuals, at different ages, and in the two sexes. In fact, it is sometimes a very obtuse, and sometimes a right angle: this last is most common in the female, and is one of the causes of the prominence of the great trochanter.—*Descriptive Anatomy:* Cruveilhier.

The neck is long and oblique in the adult male, shorter and more horizontal in the female and in old age.—*Anatomist's Vade-Mecum:* E. Wilson.

The neck forms a more or less obtuse angle with the body of the bone, and the angle varies according to the age of the subject, becoming more acute in advanced life from a process going on within, termed by Mr. B. Bell "interstitial absorption;" in consequence of which the neck is shortened, and the head sinks below the level of the great trochanter, and, in the language of the botanist, is rendered *sessile.*—*A Practical Demonstration of the Human Skeleton:* G Elkington.

The neck of the thigh-bone in old persons undergoes an interstitial absorption by which it becomes shortened and altered in its relation to the shaft of the bone; so that the head of the bone, instead of being above the level of the trochanter, sinks almost to its root.—*Lectures on Surgery:* Sir A Cooper.

The neck, instead of being oblique in its direction, becomes in old age horizontal, and inserted nearly at right angles into the shaft.—*The Science and Art of Surgery:* J. Erichsen.

larity of the morbid appearances found after this accident to those consequent on the above complaint. He says:—"We have also reason to think, that falls upon the great trochanter have given rise to the first symptoms of this disease." In alluding to this observation, Dr. Todd observes (Croonian Lectures)—"This is by no means improbable, nor is the fact opposed to that view of the disease which assigns it a *rheumatic* origin: for doubtless the perversion of nutrition excited by the violence of the fall would, as often happens in gout, occasion a greater attraction of the rheumatic matter to the injured joint, than would otherwise have taken place." I have already quoted a passage from Mr. B. Bell's work, a portion of which bears upon the present question:—"In the cases which occur in middle age, it (interstitial absorption of the neck of the thigh-bone) does not in general appear to be an idiopathic affection, but is the *direct result of cold, or a fall, blow, or injury of the trochanter major.*" The latest authority on this subject, Mr. Smith, of Dublin, remarks:—"The limb becomes shortened, the foot everted, and not unfrequently we will find in such cases *all the symptoms of chronic rheumatic arthritis established.*"*

Not only are the appearances found after death analogous to those seen when the hip is affected with the rheumatic disease, but the symptoms during life are the same. In both there is stiffness; limitation of motion in certain directions; dull, wearying pain in the joint and extending down the thigh, aggravated at night, and after exercise, increased in damp and frosty weather, and augmented by inclining the limb in particular ways. There is shortening of the latter; some wasting of the soft parts round the hip; inability to support the weight of the body long on the

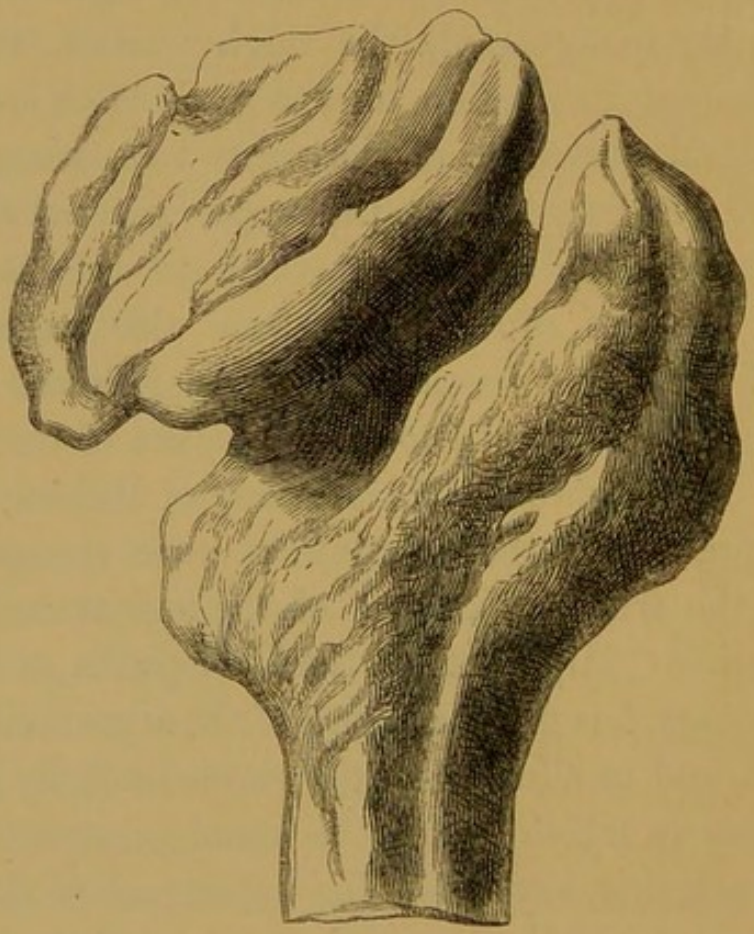
* A Treatise on Fractures in the vicinity of Joints.

affected side without inducing dull pain in the articulation, absence of redness, and undue heat of the part, &c.

The late Mr. Matthews (the comedian) was the subject of the form of injury under consideration, in consequence of his being thrown from his gig; and it was stated by Mr. Snow Harris, at a meeting of the British Association, in Dublin, in the year 1836, that the patient had got up and walked immediately after the accident, but continued lame from that period up to the time of his death. He had been attended by some of the most celebrated surgeons in London, but they had not been able to determine whether there was a fracture of the bone or not, but kept him lying on a sofa for nearly twelve months. The injured limb was shortened, the foot everted, the thigh wasted, and owing to the constant inclination of the body forward on one side, a lateral curvature of the spine took place. After death, Mr. Harris removed the upper part of the femur and acetabulum, and presented them to the Association, with the view of proving therefrom that intra-capsular fracture of the cervix femoris might be followed by bony union, for such he believed to be the nature of the specimen which he had secured. Mr. Adams, of Dublin, however, who was present at the meeting, at once recognized and explained the true significance of the appearances, and in his able article "Hip-joint" in the Cyclopædia of Anatomy and Physiology, has given a figure of the upper end of the thigh-bone, and in alluding to the close similarity it bore to the condition in which the part is found in cases of chronic rheumatic arthritis, says:—"The upper part of the head of the femur was exceedingly rough on its surface, and of an oval form from above downwards: the axis of the neck was at right angles with the shaft, and seemed to run horizontally inwards and backwards, so that the length of the fossa which exists posteriorly between the corona of the head

and the posterior inter-trochanteric line, was in this case less than a quarter of an inch,—a fossa which we know naturally measures two inches. In viewing the oval form of the head, we conclude the movement of rotation must have been impossible; from the shortening of the neck posteriorly we can infer that the toe and foot must have been greatly everted; and from the depression of the head to the level of the trochanter the femur must have been nearly one inch shorter than the other. The lamented individual had not suffered from the disease more than ten years, so that the morbid appearances were not to the same

Fig. 15.



amount as we are accustomed to see as the result of this very slow disease." Mr. Adams has not failed to notice the condition of the acetabulum, which he speaks of as being widened, with the fossa for the Haversian gland completely

filled up. It is due to Mr. Snow Harris to state that he readily became a convert to the views of Mr. Adams, than whom there is no one better able to offer an opinion upon a subject which he has so long, laboriously, and successfully investigated. The specimens were subsequently presented to the College of Surgeons of Dublin.

At the risk of appearing tedious in this account, but feeling, at the same time, the high importance of my subject, and knowing full well the value of illustrative cases, I am induced to append another one, which I have found in the case-book of Mr. Howship :—

Case III.—August 22d, 1831. Joyce Powell, aged 70 years: last July twelvemonth was first seized with flooding, which afterwards returned with fury and frequency, accompanied by urgent bearing down and straining. Her right hip (her daughter told me) had been put out when she was a girl thirteen years of age. It had never been properly set. It was so bad the next morning that she could not walk, and so swollen that they could not set it. The hip never hurts her except on change of weather, in windy weather most, when it aches, and she can tell when a change is coming. The daughter often heard her relate the story. She was running about the house, and slipped down and put her hip out. She went to bed, and the next day there was so much swelling that the medical persons told her that the hip could not then be reduced, but, to the best of her belief, it never was properly reduced.

She died in the House, of carcinomatous disease of the womb.

The next day I examined the body, and found that, although the knee of the right side was perfectly straight and equally forward, the right heel was at least two inches higher than the left, partly compensated for by the foot being turned, as she generally walked on her toes very

much. Foot neither inverted nor everted. On examining the hip, I found the trochanter was placed upward and forward, and less outward than on the opposite side. I could also quite distinctly see, and most distinctly feel, the head of the femur partly projecting forwards towards the pubes, so that in detaching the tendon of the psoas magnus and iliacus internus, which passed round the capsule enclosing the head, I thought, at first, I had opened the capsular ligament. There was a considerable extent and thickness of bone deposited in front and round the sides to form a new acetabulum. The capsular ligament, as it now presented itself, did not seem materially thicker than natural.

August 24th.—Divided round the capsular ligament, which I found much thickened and very strong, although very willing to admit a sufficient extent of motion with safety to the joint. The cavity of the acetabulum was very deep, but no trace of the round ligament or depression for its insertion. On the head of the femur there is no remaining trace of the impression for the attachment of this ligament. The neck of the femur is very short, but still existing.

Nov. 23.—Bones now clean. The dislocation appears to have been upwards upon the ilium, the head of the bone having rested above the cartilaginous margin (at this age) of the joint. Judging from the quantity and position of the deposited new bone, which formed a complete new cavity between the pubes and ischium, it appears to have been a secondary consequence of osseous secretion taking place into the substance of fibrous structures, which Ambrose Paré says he found to occupy the cavity of the joint in unreduced dislocations.

The above is the account extracted *verbatim* from Mr. Howship's Case-book; and as the preparations are pre-

served in the Charing Cross Hospital Museum, I am enabled to give the appearances they present a little more in detail. Even a superficial examination of them, however, completely disproves the statement that the hip is the subject of any ordinary unreduced dislocation; indeed, they are but those which we so commonly see exhibited in *chronic rheumatic arthritis;* but there are certain peculiarities withal, which would seem to show that the joint had been the seat, originally, of some unwonted form of injury. But, before proceeding further with these remarks, it will be necessary to describe more particularly the condition of the parts forming the articulation.

The *Acetabulum* (Plate IV. fig. 4) is increased in size and measures 2½ inches in the vertical and 2 inches in the transverse direction. The upper half of this cavity is much broader than the lower, beyond the level of which it projects considerably. The former part, at its margin, is thin, spiculated, and irregular, presenting small grooves and pits above, but is even and polished below. Nearly the whole of the upper half of the socket is porcellaneously coated within, and presents a very large number of apertures. Within the lower half new bone has been laid down, having a slightly uneven free surface: it is a quarter of an inch thick where it forms the edge of the cavity, but becomes thinner by degrees as it recedes from this part. A portion of it is continued across the notch of the acetabulum; the notch being more than an inch in breadth. The broad deposit of bone is so placed as to fill up the depression for the ligamentum teres, and effectually prevent the ingress of vessels to the head of the femur. In consequence of the increased capacity of the acetabulum, its inner edge has advanced below to the ilio-pectineal eminence, whilst above it has encroached upon the inferior spinous process and dorsum ilii.

The *head of the femur* (Plate IV. fig. 3) corresponds in its admeasurements to those above given of the acetabulum, and is encrusted with porcellaneous material to the same extent, and in the same situation as the latter. A layer of new bone deposited upon the lower and posterior part overhangs the neck and projects backwards to the distance of half an inch; the inclination of it is likewise outwards, so as to leave an interval behind, between the trochanters and its margin, of half an inch only. The cervix has not descended to any great extent, and the general appearance of it with the head might warrant the likeness to a mushroom with a thick and stunted stem.

From this account it is evident that the hip is not the site of an unreduced dislocation, but I think it not improbable that the injury inflicted might have loosened the upper part of the cartilaginous margin of the acetabulum from its attachment, so as to allow of the glutei and other muscles in the neighbourhood drawing the head of the bone somewhat upwards. Under such circumstances, the length of the limb would have been diminished, and the absence of fracture being ascertained, a luxation was believed to have occurred, as it is reported that "running about the house she put her hip out: the next day there was so much swelling that the medical persons told her that the hip could not then be reduced." Were the real nature of the mischief such as I have surmised, it is easy to comprehend that the bone "was never perfectly reduced." Again, where the original injury is a contusion of the hip only, there would be no symptoms at the time to rouse suspicion of further mischief; for it is only after a lapse of a variable period that shortening of the limb is observed to occur, and to continue its progress, whilst the treatment is simply directed to the relief of a bruise, alone. In the present instance, however, some symptoms (it is fair to presume) must have been pre-

sent to incline the medical man to the opinion of luxation, and the tenor of the history would lead to the belief that reduction had been attempted. Lastly, the presence of new bone on the part of the femur and acetabulum which had been separated from one another, would (supposing my view of the nature of the injury to be correct) tend to show that such separation had occurred, and that the denuded cartilage had been removed, and its place supplied by bone to fill up the interval between the surfaces originally and normally in contact, so as to restore, as far as possible, the former integrity of motion.

From these considerations I would imply that the hip-joint had suffered something more than a bruise, that it had been the seat, indeed, of a peculiar form of injury. The supervening disease has, by interstitial absorption, &c., implicated the head and neck of the femur with the acetabulum, and the appearances of these parts are those to be seen so commonly in chronic rheumatic arthritis; whilst the symptoms during life, as far as they are given, are characteristic of this complaint.

I cannot conclude these observations without making allusion to another important subject which should always be borne in mind, and which otherwise might entail much suffering to the patient, and be productive of great blame to the surgeon; I allude to those cases where violence has been applied to the hip, and the signs of fracture in its vicinity are to be observed in consequence of this joint having been for some time previously the seat of chronic rheumatic arthritis. The shortened limb, everted foot, difficulty of, and pain on motion, proximity of trochanter to spinous process, &c. tend greatly to deceive: but as this point cannot be more ably discussed than by an author (Mr. Smith, of Dublin, op. cit.) who has paid considerable attention to it, I shall, in conclusion, adopt his words:—

"We are, in general, enabled to ascertain the real nature

of the injury by observing the relation which the trochanter major bears to the anterior superior iliac spine: this relation being the same upon each side, is usually sufficient evidence of there being no other injury than contusion; but it is to be remembered, that the normal relation of these two processes being altered, does not always imply the existence of a fracture of the neck of the femur, and I can suppose a case in which the position of the trochanter major, with respect to the iliac spine, will not serve as a diagnostic mark between a contusion of the hip, and the impacted fracture of the neck of the femur. For instance, a man of advanced age, who has long suffered from the effects of chronic rheumatic arthritis of the hip-joint, falls upon the trochanter and receives a severe contusion,—how are we to distinguish this case from one of imparted fracture of the neck of the femur? In both there is shortening of the limb, eversion of the foot, and a change in the position and bearings of the trochanter major: in neither can we elicit crepitus, or elongate the shortened limb: in neither can the patient raise the limb *en masse*, or it may be that in each that he has supported his weight upon it, or even walked a little after the receipt of the injury. If we find upon questioning the patient (and in such cases we should never omit to institute the inquiry) that he has been long subject to pain and stiffness in the joint, that he walked lame in consequence of a gradually increasing shortening of the limb; if, in short, we find that he has been suffering from the symptoms of chronic rheumatism of the hip-joint, and if the powerless state induced by the recent injury wears off under treatment, we have, of course, the grounds for believing that there is no fracture of the neck of the femur: and upon the other hand, we are justified in supposing that some more serious injury than contusion has taken place, if, after long confinement to the horizontal posture, the patient still remains incapable of using the limb."

ON THE EMPLOYMENT OF

PURGATIVE MEDICINE AFTER THE OPERATION FOR HERNIA.

Mrs. J——, æt. 54 years, had been ruptured for twenty years on the right side, but never having experienced any inconvenience, had neglected to wear a truss during that period. Her bowels were always moved with regularity. In the afternoon of the 3rd February she suffered from pain at the pit of the stomach, increasing in severity during the night: the bowels at this time were confined. On the 4th she was attacked with vomiting, and in the evening with hiccough, which during the day had troubled her occasionally, but now became more frequent: the bowels were still unrelieved. The next day (5th) the symptoms continued, with a general aggravation of them. On the evening of the 6th, Mr. Echlin was called to see her, and found an irreducible femoral hernia in the right groin. The persistence of the above-mentioned symptoms in a still worse degree induced him to have recourse to a remedy, which, even in such an advanced stage of the complaint, he informs me he has known to succeed,—viz. a turpentine enema: its employment, however, in the present instance was unavailing. On examining the condition of the patient and tumour, I advised that the operation should not be delayed; and at half-past one A.M. of the 7th inst. I relieved the strangulation by the ordinary procedure. The gut was found closely embraced by a portion of omentum which firmly adhered to it: it was much engorged from

blood effused between the tunics, but the polish was unimpaired, though at one part a patch of lymph was seen. The stricture was very close. The patient was put to bed, and hot fomentations directed to be constantly applied to the abdomen. These were continued at intervals during the day: warm drinks were allowed occasionally, but purgative medicines were withheld. A sensation of "working" was soon felt in the bowels, accompanied by a "rumbling" noise; the pain had gradually subsided since the intestine had been freed: the sickness ceased, and, in short, all unpleasant symptoms disappeared. In this state she continued until ten o'clock P.M. of the 10th inst., when a gentle enema was administered, which in the course of the night operated twice. Day by day she continued to improve, the bowels being relieved once or twice with regularity during the twenty-four hours, occasionally under the influence of laxatives, sometimes without their assistance, and a perfect recovery was the issue of the operation.

In the above sketch it will be seen that after the operation no purgative medicine was given for many hours, and the omission was intentional; inasmuch as I believe that I have had, in several instances, the opportunity of witnessing their injurious effects when administered, as they so commonly are, as early as the third, fourth, or fifth hour after the bowel has been liberated. It not unfrequently happens, as with Mrs. J——, that shortly after the gut is replaced, a rumbling noise is heard within the abdomen, and the patient feels, in proportion as this increases, that there is desire to have the bowels moved; but the sensation is far from an urgent one, and shows that the movements of the intestines are taking place which would lead to the ordinary propulsion of their contents, but for the inactivity of that portion of the gut which has been injured by pressure, and thus for a while rendered incapable of continuing its

function. It has been hurt, and requires rest; it has been forcibly impeded in performing its office, and cannot at once resume the duty: its sluggishness points out the mischief induced, which calls for quietude but may resent interference. Were its want of action with continued constipation producing symptoms of a grave character, then, indeed, purgative measures might be put into requisition to subdue the cause: but such is not the case. The patient's condition is most materially amended, and the residual inconvenience has for its origin the constriction of the gut on the one hand, and the shock of the operation on the other. Even the supervention of peritonitis, with a still confined state of the bowels, brings forcibly to mind the great injury the delicate gut-tunics have sustained, but not that the evil is due to constipation.

If we take into consideration the state into which the part is thrown consequent to the passage through it of purgative medicine, it will be found quite incompatible with the fulfilment of the due indication of treatment. Such so-called remedy gives rise to a temporary state of excitement in the gut, evidenced by its increase of temperature, vascularity, augmented secretion, and peristaltic movement; whereas, after the operation, in the majority of cases, we require that vascular turgescence should be diminished, that any stimulus to secretion during a state of congestion be withheld, and that the wonted movements of the part be kept in check, or, at all events, not urged on, until the bowel has had time to recover its normal condition, and thus the muscular fibre be in a fit state to act without becoming, by its movements, an additional source of self-irritation, and disturbance too, of its adjacent tunics. I am happy to be enabled to quote the authority of a very able surgeon,—Mr. Arnott,* on this subject:—

* Lancet, June 1842.

"The bowel then having been returned, how was its recovery, its restoration to a healthy state, to be promoted? Certainly not by the exhibition of purgative medicines. It is in the condition of a part which has sustained a physical injury; and as you would not expect a person with a bruised, swollen, and inflamed leg, hand, or arm, to be benefitted by exercising the part, so also in the case of a portion of bowel similarly circumstanced, rest and quiet would seem to be the most appropriate."

In canvassing the question of advisability in the administration of purgatives after the operation, we should remember that though a mechanical obstruction, in the first place, formed the impediment, it has by its continuance, in the second place, given rise to that condition of the strangulated gut, incompatible, for a time after its liberation, to the onward progress of the intestinal matters. The surgical means employed overcame that upon which the constipation and concomitant symptoms depended,—the mechanical barrier, and in so far afforded the bowel the opportunity of pursuing its functions; but, the consequences of the constriction, that state of gut necessarily induced, has yet to be relieved; and if adequate time be allowed, purgative medicines withheld, and a soothing plan be adopted, Nature will, I believe, the while be as gradually aiding to perfect the cure as when rest and fomentations simply accomplish the recovery from a sprained ankle.

Let us for a moment consider, more in detail, the condition in which the intestine is placed; the effects produced by its constriction, at the time when the operation for strangulated hernia requires performance. And here I would remark, that in addition to the practice which is still pursued by so many of giving purgatives subsequently —nay, too frequently before the operation, likewise—the system of unduly delaying surgical interference will be

found most materially to have augmented those morbid states which spring from the constriction of the gut. The bowel, upon becoming narrowed where it passes through the ring, is by degrees more and more girt, as intestinal matters from above are propelled towards it. This distension increasing, the difficulty of reduction is augmented, and vascular excitement of the gut speedily ensues: the muscular fibres at and for some way above the seat of stricture become inflamed, so that air and fluids only find a passage towards the ring; for the propulsion of solid matters is prevented from the above-named condition of this middle coat: thus, too, is the bowel within the abdomen additionally distended, whilst that without it becomes more tumid from some flatulent and fluid additions. And as both parts are in this manner suffering, they become intensely congested, but the gut within has its circulation maintained, whilst the bowel without is threatened with death from the impediment offered to the free passage of blood by the stricture. The mucous membrane of both portions is in the same condition also, whilst the part embraced by the ring begins to ulcerate first in that situation where the pressure upon it is greatest, and this absorptive process soon extends in a circular form, and always occurs before the sloughy destruction of the muscular coat; lastly, the mischief extends to the peritoneal covering, which suffers a similar death. The strangulated bowel dies sphacelated. Extension of pain from the site of stricture, radiating thence, as it were, over the abdomen, together with the condition of the pulse, the peculiar aspect of the features, the distended belly, &c. strikingly indicate that the serous membrane, too, is extensively implicated; and accordingly we find that it at first becomes much reddened, whilst a thin, delicate, and almost transparent film overlays it, which speedily becomes larger in amount, of a yellowish

hue, and more adhesive, accompanied by effusion into the abdominal cavity of turbid, flaky serum—in short, acute peritonitis has set in. An active inflammatory condition has succeeded to one of constitutional excitement, to be followed by stages of depression and death. The morbid processes are those of absorption, deposition, and destruction. Such, then, are the constitutional—such the organic phases in strangulated hernia. None of them should be forgotten—all should be known—all duly appreciated. Whilst speaking of "morbid" processes it must be borne in recollection, that from the first moment of a piece of gut becoming incarcerated until the time of its sloughing away, these processes are nevertheless directed throughout towards the conservation of life. Witness, in the first place, the increased peristalsis set up to free the bowel, and secondly, its subsidence when this means fails and others require to be enforced; then the ulcerative process occurs to cut off the offending part which, becoming loosened whilst it dies, adhesive lymph binds down the remaining portion, and fatal extravasation is prevented, as Nature rids herself of an offending and now useless part.

How often does it happen, that the patient, after the return of the bowel by operation, expresses his great relief from all the more urgent symptoms: and we see, indeed, full evidence of the fact in the return of a placid expression of countenance, the comparative freedom from pain, the cessation of vomiting, the condition of the skin, pulse, &c.; and when such general amelioration ensues, we know that the gut must very greatly participate in it, and should reasonably expect, that in proportion as the surface of the body continues to become more natural, the circulation more equable, the pain abated, the general suffering lessened, &c. so are the effects of the constriction diminishing—the state of the gut improving. It was with a

view to free the intestine from a tight embrace, to prevent its impending death, to ward off peritonitis, or to guard against the fatal shock which, in certain constitutions, a hernia strangulated produces, that the operation was performed, but not to relieve a constipation; and in very many cases this latter forms now the remaining prominent symptom—it may be the only one; and we must take into consideration, that though speedy relief has been afforded to the cause of it, still the effect has to be more tardily overcome, inasmuch as the condition into which the gut has passed will militate strongly, for a time, against its capability of resuming the office of propulsion. I should say, consequently, the longer the period that strangulation has occupied, the less should be the urgency for administration of purgative medicine, after freedom being established by operation.

A mode of practice not unfrequently adopted before the knife of the surgeon interferes, is the exhibition of a purgative, with a view to excite the action of the bowel, and so induce liberation by its own efforts; which failing to effect, and the stricture, after all, having to be divided, fresh purgatives are given, without reference to that or those previously exhibited, whereby such an inordinate action is set up in the intestine that the patient sinks exhausted from a diarrhœa which we are unable to abate. The "habit of body," too, is not unfrequently overlooked or neglected, especially in women, who are often accustomed to allow the bowels to be confined for two, three, or more days; and in that case, if a hernia become quickly strangulated and require a speedy operation—as in the femoral variety it may—surely purgatives are here not called for with that promptitude with which they are too often exhibited. The hand of the surgeon is employed to loosen the constriction, and through this, the bowels. His *adju-*

vantia should now, and for a time, be rest, quietude, fomentations, a mild spare diet, and in many cases even a sedative dose.

Again, purgatives may act injuriously thus: peritoneal inflammation setting in after them, they may by their operation so add to the mischief as to render the employment of the remedies for this disease ineffectual; or they may, indeed, induce this complaint, if given quickly and freely, as they often are, so constituting the origin of the malady, and the material opponent to its favourable issue.

The advice of Mr. Lawrence is much at variance with what I have advanced. He says, in his Treatise on Ruptures, p. 325, "Sometimes inflammatory symptoms characterise the strangulation from the beginning, and lead us to operate early. Inflammation of the abdomen exists at the time, and sometimes after the operation. Active antiphlogistic treatment is necessary. The use of aperients is not to be neglected: they will produce copious evacuations, although we cannot suppose that there is much fæcal accumulation. Our efforts in such cases are sometimes ineffectual; the inflammatory disorder proceeds unchecked, and its nature is clearly evinced in examinations after death."

In a case that I operated upon some months since, I believe that I had reason to congratulate myself that I did not follow the above instructions. The patient was a female, aged sixty, who had had a femoral rupture for twenty-two, and had worn a truss for sixteen years. Her symptoms being urgent at the time of seeing her, I relieved them at three o'clock P.M. by the usual operation, in which I was kindly assisted by Mr. Hancock. No medicine was given afterwards, but on the next and two subsequent days I had to treat her actively for an attack of peritonitis, neglecting the use of purgatives from being

unwilling to run the risk of copious evacuations following A gentle dose of castor-oil, after the abatement of the inflammation, produced six motions; and from that period, with an occasional resort to the above medicine, the bowels continued to be relieved, and the patient made a good recovery. If aperients had been given at the onset, or under the inflammatory condition, I believe that the result of such treatment would have been most unfavourable. If evacuations are to be produced under peritonitis, it is best, as Dr. Armstrong has expressed it, to "*open the bowels with the lancet.*"

The question, however, concerning the call for purgative medicine in peritoneal inflammation is one which would be differently answered by different medical men,—some laying great stress upon the necessity for their exhibition, whilst others warily object to their employment, at all events until the more formidable symptoms have been subdued. Dr. Watson thus expresses himself in his Lectures:—"I do not think that the good which they are calculated to do as antiphlogistic remedies can be at all put in competition with the harm that I am persuaded they may produce, by increasing the peristaltic action of the intestines, and so causing additional friction and tension of the inflamed membrane."

We must now consider—Is there any circumstance in reference to the occurrence of peritonitis after an operation for hernia, which renders its nature dissimilar to the disease, originating in cold, for example, applied to the abdomen, a blow received upon it, &c.? I know of none; for the same symptoms characterise the progress of the affection in both cases: a *post-mortem* examination points out no distinctive differences; or, the same plan of treatment in both may result in the preservation of life. If, after the relief afforded by the surgeon, we could think

that the supervening mischief arose from an accumulation of intestinal matters, then I should say that their extrusion, as originating the disease, might be gently solicited, whilst other measures attack the effect produced. But where the complaint so obviously arises from the "physical injury" done to the part—where the very presence of the inflammation is an additional cause of the bowels being unmoved, and where inflammation of a part should warn us not to interfere with the results of the process set up —I should deem it injurious to exhibit medicines with a view to overcome the constipation.

On referring to Mr. Lawrence's justly esteemed work, I find the following instructions respecting the exhibition of medicine after the operation, p. 323 :—"If, therefore, the bowels should not have been relieved in three or four hours, a few grains of calomel may be given in a pill, or two pills may be administered, consisting of calomel and compound extract of colocynth, in equal parts. The sulphate of magnesia may be given afterwards, in the dose of two drachms or of one drachm, in the infusion of roses, or in a mixture of mint-water and common water; and this should be repeated every three or four hours until the bowels are freely relieved. If this desirable result should not occur after the second dose, a large common injection should be thrown up, with the addition of four or six ounces of castor oil. We must repeat these or similar means, and persist in their employment until the canal is completely unloaded." The patient is expected to get well after this treatment! The practice here advocated, without any reservation as to the state in which the protruded gut is found to be, is strongly contrasted with the safe and successful treatment employed in the case (Mr. Arnott's) which I have referred to, wherein I find that the operation was performed on the evening of the 17th of March, and

on its completion "strict injunctions were given that no aperient should be exhibited;" indeed, the first appeal to the bowels was by an enema of gruel not before five o'clock on the afternoon of the 20th inst., and the previous plan of treatment had been "slop diet, fomentations, and the abstraction of sixteen ounces of blood, which was not buffed." We thus learn that at least forty hours were here allowed to elapse before it was deemed advisable to administer an enema, and the favourable issue of the case bespeaks the judicious nature of the treatment. The tenor of the subjoined directions, from the able pen of Mr. Guthrie, is, I believe, much in accordance with what I have advanced:—"In recent herniæ which have been operated on, none but the gentlest aperients should be given, the object being to persuade the bowels to act, and not to force them by irritation. They have been, if they are not, actually in a state of inflammation, and an irritating purgative may induce its return, and counteract the effect for which it has been given. If, on the contrary, it acts violently, the intestine, weakened by the congestion and inflammation which it has suffered, may not be able to sustain this superadded irritation." Here we find that the use of none but the most gentle aperients is enjoined; and when the condition of the gut will, in all probability, at the time of the operation be of the character described, it is reasonable to presume that the medicine spoken of would not be administered until a longer time is allowed for recovery to a natural state than that ordinarily given, when the bowels, if now requiring it, may be persuaded to act, and only that necessary amount of irritation be induced which their more healthy condition will enable them to respond to with readiness; and thus the medicine performs its office efficiently.

In conclusion, I am glad of the opportunity of recording

the corroborative sentiments expressed in the following note:—

"My dear Canton,—In compliance with your request that I would give you my opinion as to the propriety of administering purgative medicine soon after the operation for strangulated hernia, I have no hesitation in stating that I consider such treatment to be injurious to the patient, in most instances. Unfortunately, the operation is too commonly delayed until the gut is in a state of inflammation, sometimes of gangrene; and nothing has appeared to me more injudicious than in irritating the intestines in such conditions by purgatives. If the bowels do not act when the constriction is freed, what does this arise from? From loss of power (temporary or permanent, as the case may be) to carry on their natural functions, resulting from the violence to which the gut has been subject by that constriction. If the gut has not become inflamed from the constriction, then there will be no danger of waiting a reasonable time, to allow the patient to recover from the shock of the operation and the impression made upon the nervous system, arising from the strangulation of the hernia. If, on the contrary, the gut has become inflamed, why should the case, after the operation, be treated differently to any other case of enteritis?—why, in addition to that operation and strangulation, which all know of themselves to produce such a shock to the patient's nervous system, should he be subjected to the additional shock of unavailing, irritating purgatives? It is said they cause the bowels to act: I doubt that very much. I have always considered the activity of the bowels a sign—a most satisfactory sign—of the subsidence of inflammation; and I believe that this happy effect is much more safely brought about by opiates, local or general bleeding, if necessary, and other methods which reduce inflammatory symptoms.

I have seen cases where the bowels did not act for two days after the operation. One of these was operated upon by yourself; and I have no hesitation in saying, I consider the patient owes her life to your judicious treatment.

"Ever yours truly,

"HENRY HANCOCK."

ON THE OCCURRENCE OF A

CYSTICERCUS CELLULOSÆ

IN THE SUBCONJUNCTIVAL AREOLAR TISSUE.

Cases of this peculiar affection have been placed upon record by several authors, amongst whom may be mentioned Mr. Estlin* (who has met with two examples), M. Sichel,† Baum, Hoering, Cunier,‡ and Mr. Bowman.§ They are to be regarded, however, of unfrequent occurrence, and are met with, for the most part, in young subjects, or persons under thirty years of age.

The most frequent situation of the tumour is either towards the outer or inner canthus; and it is generally so placed, that when the patient looks directly forward it is to a great extent, if not wholly, concealed from view by the lids. When, however, the eye is directed to the side opposite to that on which the swelling occurs, the latter is made to project, and becomes more conspicuous still when the lids are gently held apart. The tumour is now seen to be of a subglobular or ovoid form, with its long axis placed transversely, and presenting at some portion of its circumference a part which is opaque, and of a yellowish hue; whilst in its general extent the

* London Medical Gazette, 1838 and 1840.

† Quoted in the Lancet, Feb. 14, 1846, from the Gazette des Hôpitaux..

‡ Annales d'Oculistique.

§ Medical Times and Gazette, Nov. 1852.

investing conjunctiva is plentifully supplied with delicate blood-vessels. The tumour is indolent, painless, does not interfere with vision, affords little if any impediment to the free movements of the lids, and is, in general, rather closely attached to the subjacent sclerotica. In a case which was operated upon by Baum, of Dantzig, a depression remained in this tunic after the removal of the hydatid, but in this instance the conjunctiva covering it was thickened.

The subjects of this affection have seldom a healthy appearance, and intestinal worms are not unfrequently associated with the complaint, or have been present in earlier life.

The subconjunctival cysticercus is always to be found ensconced in a cyst composed of a dense interlacement of fibro-cellular tissue, having a smooth internal surface, and containing, besides the entozoon, a little clear fluid. When situated within the chambers of the eye it is similarly circumstanced, being there too in a closed cavity, and surrounded by a liquid. The cyst has never been known to accommodate more than one tenant.

The following case came under my care a few years ago, at the Royal Westminster Ophthalmic Hospital, and was the first example which I had seen: since that period, however, I have assisted Mr. Charles Guthrie in operations upon two others, and a fourth case has fallen under my own treatment.

Case.—Wm. S——, aged two years and seven months, is of strumous diathesis, and has never suffered from illness since its birth. Seven months ago, his right eye was touched accidentally by the point of an umbrella,—without giving rise, however, to any unpleasant symptom. A week or two afterwards, the father, on depressing the lower lid, observed for the first time a tumour attached to

the eyeball, about the size of a small pea, and which the lid had entirely concealed from view. The tumour, he states, has, from that period to the present, been slowly and steadily on the increase, without producing any inconvenience.

The lower eyelid was now noticed to be slightly bulged forward, near the inner canthus, and upon depressing it an oval tumour projected, the seat of which was the areolar tissue between the sclerotica and conjunctiva. Its size was that of the little finger nail, and it had so encroached upon the inferior palpebral sinus, that when the lids were even widely apart, it was completely concealed from view. Its consistence was that of soft jelly, and its colour, so far as it could be judged of through the rather vascular conjunctiva stretched over it, was yellowish. Vision was perfect, and the general appearance of the eye healthy, with the exception of the slight congestion just alluded to. The tumour did not appear to cause the child any annoyance, or to interfere with the movements of the eyeball or lids; but the father wishing to have it removed, I depressed the lower lid as far as possible, and with a curved pair of scissors cut away an elliptical piece of conjunctiva from the most prominent part of the swelling. A small quantity of thin, yellowish fluid issued, together with a cysticercus—the two having composed the bulk of the little tumour. The edges of the wound were, at the end of two or three days, fully united.

The entozoon was perfect, about the size of a large garden pea, and presented at one part of its circumference a circular, opaque body, projecting into the interior of the vesicle (fig. 17): the former Mr. Wharton Jones kindly showed me, under the microscope, to consist of the retracted head and neck of the hydatid.

The operation on this small tumour, though it, on first

thought, might appear to be of a trivial and almost insignificant character, has, however, in some instances given rise to more than anticipated trouble, as may be seen by referring to some of the published cases of the authors already alluded to; and doubtless the dissection of a closely-adhering cyst from the sclerotic, and where, too, the conjunctiva is thickened, and yields much obscuring blood upon incision, from its augmented vascularity, is liable to necessitate both tedious and delicate manipulation. In the last case of the above description which I assisted at, all such trouble, however, was done away with by first fixing the eye, and then gently passing a double-edged cataract-knife through the conjunctiva into the cyst from below upwards, and close to the part where it was attached to the sclerotic. The opening was made of sufficient size to allow of the exit of an hydatid fully as large as the specimen above figured, and which escaped at once, and perfect, with its head and neck retracted into the tail-vesicle. For some days after the operation (which was performed by Mr. Charles Guthrie) the tumour was as large as previously; but it gradually diminished in size until the conjunctiva attained its natural level, appearance, and mobility.

Fig. 16. Fig. 17. Fig. 18.

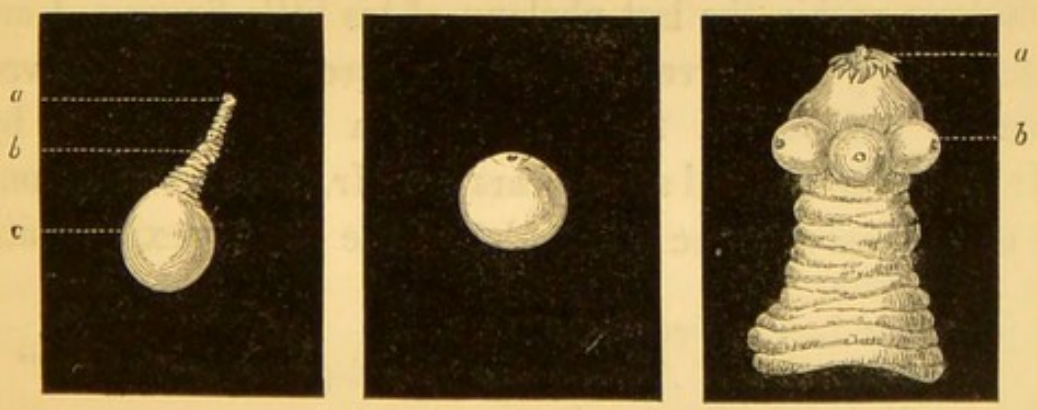


Fig. 16 —*a*, The head; *b*, the neck or body; *c*, the tail-vesicle.

Fig. 17.—The head and body retracted within the tail-vesicle.

Fig. 18.—*a*, The uncinated rostellum or proboscis for irritation and adhesion.

b, The suctorial discs for imbibing the surrounding nutriment.

An excellent account of the peculiarities of the cysticercus, accompanied by magnified and other figures of it, is given by Dr. Knox,* Professor Owen,† and Mr. Gulliver.‡

Besides being found occasionally beneath the sclerotic conjunctiva, this entozoon has been met with in the eyelid, and in the aqueous chambers of the eye. Mr. Lawrence states that it is found all over the body of the domestic pig under certain circumstances, when the animal is said to be "measled." It also occurs in the eye of this creature, where it has been seen in the anterior and posterior chambers. In the Veterinary College Museum, I am informed, there is an example of it in the horse's eye. It sometimes exists in the areolar tissue, between muscular fasciculi, generally, says Professor Owen,§ of the glutei, iliaci interni, psoas muscles, and extensors of the thigh. In the brain it has been discovered, and in large numbers, beneath the pia mater. Hasse‖ remarks: "In man the vascular system is almost exempt from entozoa; the cysticercus cellulosæ is the only one which has ever been found in the heart." Mr. Stanley¶ quotes a case from the Surgical Clinique of Professor Jünghen, who had a patient admitted into the Charité of Berlin with a cysticercus cellulosæ within the last phalanx of his little finger. I am informed by Mr. Greenhalgh that a specimen was removed from a tumour in the tongue of a patient of his, by Mr. Fergusson; and some years ago Mr. Guthrie found one in an abscess near the inner edge of the biceps flexor cubiti.

* The Lancet, January 16, 1838.

† Cyclopædia of Anatomy and Physiology, art. "Entozoa." Med.-Chir. Trans. vol. xxiv.

§ Loc. cit.

‖ Pathological Anatomy.

¶ On the Diseases of the Bones, p. 189.

CYSTICERCUS CELLULOSÆ WITHIN THE HUMAN EYEBALL.

Until the year 1847, three cases* only of this affection had been placed upon record; and at that time a fourth fell under my observation, and is thus referred to by Mr. Wharton Jones:† "The patient was a boy of about ten years of age. I found his cornea semi-opaque and vascular, and increased both in diameter and prominence. The hydatid which had been extracted was brought to me for examination by Mr. Canton, and was more than double the size of that in the preceding case (Mr. Logan's), and its appearance suggested the idea that it was the lens and vitreous body—the former opaque and contracted, the latter shrivelled by the draining away of the contained humour; but a slight examination of the body was sufficient to point to its true nature, which microscopic dissection demonstrated." The following are additional notes which I had made of the case:—

Case.—This patient I had the opportunity of watching for several months previous to the removal of the hydatid. During that time the most prominent symptoms were—a gradual diminution of vision, consequent upon an increasing nebulous state of the cornea which, indeed, on his first application at the hospital, was so hazy, as completely

* Neumann (in Rust's Mag. vol. xxxiii.); D. W. Soemmering (Isis von Oken, 1830); Mr. Logan (Med. Gazette, vol. xii.).

† Manual of the Principles and Practice of Ophthalmic Medicine and Surgery, 1847.

to obscure the iris from view. There was slight but continued injection of the sclerotic vessels, together with undue fulness of several conjunctival branches. By degrees the central part of the cornea projected, and became more opaque than the portion surrounding it. The boy, whose health was delicate, appeared to lose flesh during the progress of the complaint; whilst the almost constant darting pain he complained of in and around the eye was, like the condition of the latter, unrelieved by the various plans of treatment resorted to. It being, at length, deemed advisable to make an opening through the most prominent part of the cornea, a cataract-knife was used for the purpose, and the incision set free a small quantity of aqueous humour, together with a cysticercus in a perfect state. The wound healed without a bad symptom, and the operation relieved the lad from his suffering. The hydatid was much smaller than the one sketched above, but appeared as in fig. 17, with its head and neck retracted within the tail-vesicle.

Six or seven months from this period, the boy again presented himself at the hospital, and continued to attend it for some time. The circumstances of his case appearing, after a while, to require a procedure similar to the one just described, the cornea was again, to a small extent, cut through, when a substance resembling, and supposed to be, a cysticercus, escaped. These particulars I learned from Mr. Brock, who was then house-surgeon to the institution—not having myself watched the patient, witnessed the operation, or examined the presumed hydatid; all of which opportunities I had enjoyed on the former occasion.

An example of a second entozoon of this species being lodged in the eye, is to be looked upon as unique; the present case, however, as its sequel tends to show, must not, I believe, be regarded as presenting such an instance. I

should mention, that the substance extruded at the second operation was not viewed under a magnifying power, but was considered to be a cysticercus by Mr. Brock, who had seen, though not closely or microscopically examined, the former specimen.

Since this period (about three years ago) the boy has occasionally been to the hospital, but has latterly attended it as a patient. The appearances presented were as follow: The consistence of the eye less than natural, though the organ appeared to be fuller than the sound one; slight injection of the sclerotic vessels; delicate convergent twigs from conjunctival branches passing here and there over the cornea; the latter rather larger in circumference than natural, generally opaque, unduly prominent a little above its transverse axis, and in which situation was the greatest degree of opacity. The difference only between light and darkness could be distinguished. Darting, throbbing pain was complained of in the eye and around the orbit, but more especially at the temple. Various plans of treatment were had recourse to, with the view of improving the state of the cornea and mitigating the pain,—without, however, any resulting benefit. It now became a question, whether another hydatid might not be confined in the anterior chamber, producing, by its presence, the insuperable annoyance under which the lad laboured. One of these "beings" had already been liberated, with relief to the symptoms; a second, also, it was believed, was set free, and certainly under similar circumstances and with the like benefit. With these considerations, Mr. Guthrie made a limited vertical incision through the cornea, so as to include the opaque spot above mentioned; vitreous humour at once and *alone* escaped. The lid, for a minute, was lowered, and upon again gently raising it a small quantity more of the humour flowed out. It was observed by Mr. Guthrie, that

the crystalline lens was wanting. This body, most probably, had been expelled at the second operation, and mistaken for another hydatid. That the interior of the globe was wholly filled by vitreous humour was certain; for, in addition to the lens being absent, the little gush of aqueous fluid which ordinarily follows so closely upon incision through the cornea, was noticed not to take place.

The portion of cornea most opaque was seen, on its section, to consist of an unusual thickening of the part. A pad was placed over the eye, and the lad directed to keep his bed.

The operation has removed the pain complained of previous to its performance, and the case required no further treatment than the subdual of a slight inflammation. About a year after this account was published the lad came again to the hospital, when the eyeball was found to have collapsed into the orbit, and to be so shrunken as to allow of the adaptation of an artificial eye.

An exceedingly interesting and valuable case was communicated by Dr. Mackenzie, of Glasgow, to the Medico-Chirurgical Society of London on the 21st of November, 1848, and published in their Transactions of that date, wherein he had extracted a living cysticercus from the anterior chamber of the eye of a girl, ætat. 16, by first making a puncture of the cornea with Beer's pyramidal knife, and then introducing Schalagintweit's hook through the wound. "The next day the patient was quite well: the eye appeared natural, and she said she saw as well with it as the other. No reaction followed, and she was dismissed."

In this case the operation was undertaken and successfully accomplished before the hydatid had produced any mischief to the organ which held it; and I am happy to

find that my published case of intra-ocular cysticercus had assisted to the opinion of the advisability of early operative interference. Dr. Mackenzie remarks :—" Some of my friends hinted that I was rather precipitate in operating upon Elizabeth Gordon, and that I might safely have allowed so curious an object as a living cysticercus in the eye to remain for a time for the examination of those who felt an interest in the natural as well as pathological history of the entozoa. A reference to Mr. Canton's case will serve as my vindication."

The last case (the sixth) which has been published occurred in the hospital practice of Mr. Walton* in 1849, and was only seen by him after the hydatid had materially injured the eye. Here the cornea was vascular and semi-opaque: the sight had been quite lost a year previously from a sudden attack of inflammation; frequent pain had existed in the eye for six weeks. "To relieve the pain, the cysticercus was extracted. The cornea healed readily, and cleared away considerably: the pain was removed, but of course vision was not restored. The crystalline lens must have been absorbed, or the hydatid could not have passed so readily (as it not unfrequently did) into the posterior chamber. The opacity of the cornea obscured the only means of diagnosis—the alteration in the form of the vesicle by the protrusion and retraction of the head and neck."

This case may be considered as affording additional evidence in favour of the plan of an early removal of a cysticercus from within the eye. I believe with Dr. Mackenzie, that any endeavours to procure its death by the vapour of hydrocyanic acid, &c., are to be reprehended.

* Operative Ophthalmic Surgery.

A little study of the literature of the above interesting subject might, perhaps, have saved the following statement, from the pen of Mr. Howard, of Montreal*—the only statement, indeed, which he devotes to the subject of "Entozoa in the organ of vision":—"When a hydatid appears in the chambers of the eye, it is recommended to let it remain there, so long as it produces no irritation; but, if it should produce irritation, it should be removed by making a section of part of the cornea, as if for the purpose of extracting the lens." This advice was submitted to the Profession in the year 1850.

* The Anatomy, Physiology, and Pathology of the Eye, p. 501.

ON

CONGENITAL DEFICIENCY OF THE GALL-BLADDER.

In examining the abdomen of a female, aged sixty-five, who died in St. Martin's Workhouse (from disease of the brain), I noticed that the portions of intestine usually stained by bile, in its transudation, were untinged by that fluid; and on subsequently raising the liver, I found the circumstance accounted for, by an absence of the gall-bladder from its usual situation: a shallow groove for it, however, was present, lined by peritoneum.

Suspecting malposition, I searched for this viscus, or its remains, in the neighbourhood, but without success; and on subsequently making thin slices of the liver in its whole extent, I felt convinced that the case was one of congenital deficiency of the gall-bladder.

The liver was not more than about two-thirds its natural size, and was healthy in structure. Nothing abnormal was to be seen in the other viscera. The right and left hepatic ducts were of their wonted length and ordinary diameter, uniting together at an obtuse angle just below the transverse fissure, to form a ductus choledochus, which was thus, by inclusion of the common hepatic duct, a longer canal than usual, whose relations were natural, but it was possessed of a calibre nearly twice as large as under ordinary circumstances. The lining membrane of this trunk presented

the appearance characteristic of the mucous wall of the gall-bladder. The cystic artery, vein, and nerves, were wanting.

In the above case the ductus choledochus must have formed the reservoir for the bile which is being continually secreted, and the small size of the liver would show, perhaps, that there was no greater amount of this fluid eliminated than the canal could conveniently contain. An interesting point is a consideration of the mode in which the duct was induced, as it were, or forced, to part with its contents. When the gall-bladder is present, it is ordinarily believed that the abdominal muscles in their contraction so press upon it as to evacuate the bile, and that the propulsion is aided by the distension of the stomach and duodenum. In the present instance, of course, such offices were uncalled for, the bile having simply to be discharged from the ducts, which would be accomplished by the presence of chyme in the duodenum inciting their muscular coat to action, and so, by reflexion, operate upon that of the ducts: and at the same time the orifice of the canal would have its position altered, and rendered patent by the distension and movements of the duodenum.

It is curious to remark that in the lower animals we often find the gall-bladder to be naturally wanting: *e. g.* amongst mammalia, in the camel, goat and deer, amongst fishes (where it first appears in the animal series), in the lamprey, and certain species of perch; with birds, in the psittacidæ, cuculidæ, and columbidæ. It exists pretty constantly in reptiles. "There seems to be," says Müller, "no general law for its presence or absence, although the species in which it is wanting are for the most part herbivorous, and are animals in which digestion is constantly going on: yet very many vegetable feeders are provided with a gall-bladder." In the first giraffe examined in this country by

Professor Owen, there was no gall-bladder; in the second, two were found.

Congenital deficiency of this diverticulum from the gall-ducts in the human subject is not often to be met with, and some authors even disbelieve in the peculiarity ever occurring; whereas there are a few who have distinctly recorded the details of such cases; whilst there are others who have mistaken obliteration of the cavity and atrophy of the walls for original absence of the gall-bladder.

It sometimes happens that when extensive disease of the liver exists, the gall-bladder, participating in the affection, becomes so incorporated with the substance of the organ as at first sight to appear absent. Even on sections of the liver its presence is not readily detected, and such cases have been published as examples of congenital deficiency of the gall-bladder. When, however, there are calculi in this reservoir, in connection with involving disease, the real nature of the preparation is found to be more evident. This is well illustrated in a case detailed by Mr. Howship, of fungoid disease of the liver:—"The tumor occupied the seat of the gall-bladder, which appeared to be altogether wanting. The tumor was not suspected to be the gall-bladder until a careful section carried through its middle exposed a hard, central nucleus—a gall-stone, the size of a chestnut—surrounded by flocculent masses of fibrino-albuminous matter, involving many smaller calculi of angular form, all imbedded in the central part of the substance of the disease."

When the gall-bladder contains a calculus, around which it is firmly contracted, the cystic duct becomes obliterated, and eventually converted into a fibrous cord, whilst the characteristic appearance of the inner coat of the viscus is lost; and this, together with the slight remains and altered condition of the duct, might lead to the belief that the calculus was impacted in a distinct cyst: an examination,

however, of the artery, vein, and nerves of the part would tend to solve any doubt which might arise upon the subject. Cruveilhier says, "The gall-bladder and the cystic duct are not indispensable to the elimination of the bile. Nothing is more common than to find the excretory apparatus of the liver, in old subjects, reduced to the hepatic ducts and ductus choledochus." When an example is met with of an absent gall-bladder, we should, I think, expect to find that the biliary ducts would be dilated, and form thereby a compensatory reservoir for the bile, as is found to be the case in the horse. Fyfe, however, remarks that "in the equus quagga, an animal lately brought into this country from the Cape, though the gall-bladder is wanting, there is no dilatation of the hepatic duct." This increased capacity, in the human subject, has been noticed by Targioni-Tozzetti, Littre, Soemmering, Jäger, Vergne, and Boulet. The last author describes a case in which the duct formed a funnel with its expanded portion near the liver, containing a small quantity of bile. In other examples spoken of, such enlargement of the canal is not alluded to.

I believe that where instances occur of an absent gall-bladder, it is not uncommon to observe that there are other congenital deficiencies present which may be incompatible with the continuance of life, and it is on this score that many specimens of this rare peculiarity have been noticed in the fœtal state—*e. g.* in acephalous and anencephalous monstrosities. "In a preparation now before me," says Mr. E. Wilson (Cyclopædia of Anatomy and Physiology, art. Liver), "of a liver of a fœtus at the full period, which lived several hours after birth, and which presented in its anatomical structure several peculiarities dependent upon arrest of development, the most careful examination has failed to discover the slightest indication of a gall-bladder."

The Museum of our Royal College of Surgeons contains

in Sub-series 4, Organs of Digestion—"No. 134. The liver of a human fœtus with deficiency of the gall-bladder and hepatic duct: a portion of the duodenum is left attached, to show that it is connected with that viscus by blood-vessels only" (Hunterian). This specimen may probably be the one spoken of by Sir E. Home, in the subjoined passage from the *Philosophical Transactions* for the year 1813:—"A child was born at the full time, of the usual size, and lived for several months, but never appeared to increase in size, although it fed heartily and had regular stools; the skin was a dark yellowish-brown. I saw the child while it was alive, and was struck with its want of growth, and it having no fat under the skin, which made it appear longer than new-born children generally are. Upon examining the body after death, the only malformation met with was there being no gall-bladder, nor any duct leading from the liver to the duodenum." No. 135 of the same collection shows also a fœtal liver, and, according to the Catalogue, with the gall-bladder wanting. The specimen was presented by Mr. Anthony White. This case I believe to be one of imperfectly-developed gall-bladder, for the fibrous mass which it represents has in two places been laid open, and a kind of linear groove is shown, which it is probable is a trace of the cavity of the malformed viscus. A contraction may be gradually induced by any circumstance preventing the passage of the bile through the cystic duct—*e.g.* an abscess or tumor of the liver, which in its encroachments might press upon and obliterate that tube; or its closure might be brought about by an enlargement of, or any abnormal growth from, a neighbouring part, though, as Dr. Hope remarks, "the affection is frequently unconnected with any manifest cause." Another mode by which the gall-bladder, or rather its cavity, might become obliterated, is this: When a large calculus is impacted within and com-

pletely occupies it, the further ingress of bile being prevented, the now useless cystic duct (as I have two or three times observed) has become reduced to a slight impervious cord; and if in such a case the concretion had made its way into the adjacent intestine, a gradual closure and obliteration of the sac it had quitted would, it is not improbable, ensue, inasmuch as there is now no channel whereby contents could be supplied.

No specimen should be set down as one of congenital deficiency of the gall-bladder, until careful sections of the liver have been made, in order to ascertain whether or not it be situated in the substance of the latter viscus, either in a perfect, contracted, or condensed state; or, in other words, still occupying the position it holds in the early periods of intra-uterine life. Again, the condition of the cystic duct should be noted; and its presence even in the modified state referred to would justify the inference that the gall-bladder had, at some period, been present, although perhaps imperfectly formed, and from inadequate capability to the performance of its office, had become by degrees reduced to the fibrous bundle we find it.

And lastly, I believe that the atrophied vessels and nerves would tend to corroborate other testimony of the presence originally of a gall-bladder. It may be here remarked, that the cystic branches of the hepatic artery may exist, although the gall-bladder is congenitally absent, as in a case examined by Littre, where they passed into the substance of the liver. The rarity of the case under consideration is well shown by the annexed kind communication from Mr. Kiernan:—"I have never met with a case of congenital deficiency of the gall-bladder, but have seen several cases in which it had been supposed to be absent. In these instances a more careful examination satisfied me that the cavity had been obliterated, that the bladder had be-

come reduced to a condensed mass of cellular tissue, and the duct to a thin cord." Dr. Baillie says—"It has never occurred to me to see an example of this kind, but one can the more readily believe that it may sometimes happen, as the gall-bladder does not serve any necessary purpose in the body." Meckel states — "Notwithstanding its primitive narrowness, the gall-bladder is never deficient at any period, according to our observations, as one would be led to believe from some cases where its total absence has been asserted." The above remark, however, is little in accordance with the subjoined from the same author, in his description of the biliary passages :—"Sometimes, but rarely, a part of the biliary passages, particularly the gall-bladder, is deficient from a primitive deviation of formation, although this anomaly does not necessarily exercise an injurious influence on the health, which is less astonishing, since, according to the experiments of Herlin, the gall-bladder may be extirpated in cats without inconvenience, and is normally absent in many animals." Boulet once examined a case like that I have described, and subsequently in the son of the subject found the same deficiency.

ON

DISLOCATIONS OF THE ASTRAGALUS,

AND

AN ACCOUNT OF THE DISSECTION OF AN UNUSUAL FORM OF DISPLACEMENT OF THIS BONE.

When we consider the firm manner in which the astragalus is confined to its place between the tibia and fibula, and look to the great strength of the interosseous ligament, and the arrangement of the fibres which secure and support the position of its head, we should expect a dislocation of this bone would rarely happen; but on reference to surgical works it will be found that not a few cases of this accident are therein recorded.

It is gratifying, however, to find that the resources of Art in the alleviation of the mischief are great, and that where these fail the efforts of Nature are capable of affording much relief. It is admitted on all hands that the reduction of a dislocated astragalus is a matter generally of considerable, and, in some cases, of insuperable difficulty. A glance at its anatomical relations explains the cause: but much will necessarily depend upon the amount of displacement from the four bones with which it articulates, and the particular direction in which the luxation happens.

Compound dislocations of this part may sometimes be reduced where simple ones are irremediable; for, in the former, textures are torn through, which in the latter case,

remaining intact, afford insuperable resistance: and continued observation has confirmed the force of the following remarks by Dupuytren on this head:—"In some cases the reduction is accomplished with comparative facility, which I am disposed to attribute to the amount of injury sustained by the connecting ligaments. When the ligaments are not actually ruptured, but merely stretched and distended, they retain the bones in the new situations which they have assumed, and even more firmly so than in their normal position: hence the complete immobility of the dislocated astragalus in some instances. But when, on the contrary, there is much laceration of the ligaments, the bones are readily moved on each other, and the reduction is proportionately easy."

Some stress, I am disposed to think, should also be laid upon the action of certain muscles, as the two tibial, when the head of the astragalus leaves its recipient cavity, and rides over or lies on the inner side of the navicular bone. I believe that their contraction in such an accident tends to draw the scaphoid nearer to the os calcis; and this would appear feasible, when we consider that they act first upon the astragalo-scaphoid articulation; that the tibialis posticus is attached to the three cuneiform bones in addition to its insertion into the navicular; and that the action of these muscles is to draw the foot inwards by operating on the anterior range of tarsal bones, so that they would oppose reduction by fixing the upper edge of the scaphoid firmly beneath and against the head or neck of the astragalus,—in the same manner as the supra-spinatus draws upon the humerus, when the head of that bone is thrown beneath the lower margin of the glenoid cavity in the axillary dislocation. If this view of the matter were found to be correct, and other common resources failed to procure adjustment, the simple operation of tenotomy might,

I believe, with very great advantage be resorted to. On referring to Sir A. Cooper's work on Dislocations, I find, in a case of Mr. Green's, that "the head of the astragalus, which was torn from the articulatory surface of the os naviculare, protruded through the divided integuments: the *tendons* of the tibialis anticus and the flexor muscles were *tightly stretched*." The difficulty in reduction "seemed to arise from the small size of the wound in the capsule of the joint, and in consequence of the bone being *tightly held by the tendons*." After unavailing efforts at replacement, the astragalus was, by dividing the ligaments which connect it to the bones of the leg and tarsus, removed.

From the description given of this accident, I should be inclined to think that division of the tendons of the two tibial muscles, and a slight enlargement of the opening into the capsule, might have saved the necessity for a severe operation; but as the procedure had the sanction of Sir A. Cooper, and was undertaken by Mr. Green, the above suggestion might appear misplaced: still I would urge, that had the plan mentioned been employed, very little additional injury would be inflicted, even if practised unsuccessfully; and might, perchance, on the other hand, have saved further trouble in the reduction of a part which required such division of ligaments to detach it, and bordered by the posterior tibial artery torn through, with the accompanying nerve lacerated.

When, in addition to the above-mentioned accident, the astragalus leaves the mortise formed by the leg-bones, "one reason," says Mr. Dodd,* "for the difficulty the surgeon experiences in replacing the luxated part may, we imagine, be found in this,—that the bone once ex-

* Cyclopædia of Anatomy and Physiology.

pelled by violence, the muscles attached to the tendo Achillis, and indeed also those before and behind, act so on the foot as to have a powerful and effective influence in effacing the interspace between the os calcis and articulating surfaces of the tibia and fibula, so that there is now no room for it to return."

In a discussion at the Medico-Chirurgical Society, reported in the Lancet (March 1844), upon this subject, I find Mr. Erichsen adverted to the great difficulty in effecting the reduction in some cases of dislocation of the astragalus, which he attributed partly to the tonic spasm of the strong muscles of the calf of the leg, and thought that division of the tendo Achillis, as practised by Gerdy, Velpeau, and other French surgeons, might be useful when the ordinary means failed.

On reviewing the relations of the astragalus, we should, I think, from the direction of its long axis inclining downwards, forwards, and inwards; from the rounded form of its head, and larger size of that part compared with the glenoid cavity of the scaphoid, implying an arrangement for much and varied motion; from the astragalo-scaphoid articulation being only strengthened by one proper ligament situated on the dorsal aspect of this joint; and from the inclination and play of the part when the weight of the body presses on the foot (for it is to the inside that this weight is chiefly transmitted), be induced to imagine that the anterior extremity of this bone would be more favourably circumstanced for dislocation than the body, which is dove-tailed with the tibio-fibular socket, whose lateral osseous and ligamentous stays are so unyielding, is so strongly connected to the calcaneum, is protected before and behind by firmly-bound-down tendons, and is capable of motions which, comparatively, are of a more limited character than those of the head of this bone. Much,

however, will of course depend upon the amount of injury the parts in the vicinity have sustained; the direction in which the force had been applied, and the position of the leg and foot when the luxation happened; for we may even read of cases where the astralagus "has revolved on its long axis in such a way that it shall be placed, as it were, on its side, so that the pulley-shaped surface looked outwards, and the peroneal articular surface looked downwards towards the os calcis, and the facet for articulation with the tibial malleolus was placed upwards in contact with that part of the tibia which was naturally shaped for articulation with the upper part of the trochlea of the astragalus. When the bone is thus rotated on its longitudinal axis, a broader part of it is wedged in between the tibia and the os calcis than the vertical height of the astragalus would measure; and hence there is difficulty in restoring it or moving it." This twisting of the bone on its axis has been known to occur to a still greater extent, and complete rotation has placed its under surface in apposition with the articular portion of the tibia.

Two remarkable examples have been published by Mr. B. Phillips,* of a very unusual form of dislocation of the astragalus, viz. where it had passed backwards from the tibia and fibula. "There was elongation of theheel, a projection of the tendo Achillis, a shortening of the anterior part of the foot, and an anterior projection upon the dorsum formed by the inferior extremity of the tibia; there was also immobility of the joint."

I have stated that the accident most likely to occur to the astragalus is a dislocation of its head upwards or inwards: it may also be thrown outwards, so as to be placed in relation with the external malleolus. The posi-

* Medical Gazette, vol. xiv.

tion of the foot would be different in the two cases, being directed outwards in the former and inwards in the latter. The difficulty in effecting reduction, too, will depend upon the one or other form of luxation,—being greater in the latter than in the former instance.

In compound dislocations a practice is not unfrequently called for, which has often been executed with great success, and a limb preserved which would formerly have been, from the moment of the injury, a doomed one,—viz. extraction of the astragalus. It is equally true, however, that this operation has been occasionally performed when (judging from the same amount of injury having been inflicted in other cases and the bone left unreduced, recovery succeeded) no absolute necessity required its removal. Hence it becomes a matter for serious consideration, how far, in certain cases, we are justified in interfering; and we should bear in mind that the resources of Nature in this accident are often adequate to the restoration of great and useful motion of the part in the absence of the operation, which, nevertheless, may be followed by very successful efforts, but always entails additional lameness by shortening the limb.

I have in the above sketch passed in review the various kinds of dislocation to which the astragalus is liable; and on turning to the numerous histories of cases given in surgical works, it will be found that in the majority of them the bone has quitted its connections with the tibia and fibula; and the usually concomitant fracture of the latter bone will explain how such displacement is favoured. We find also in these records that the head of the astragalus is generally luxated; for, as Chelius remarks, "most probably this part is always, primarily, dislocated forwards from the navicular bone, and driven, according to the direction of the operating force, inwards or outwards;" and

Dupuytren says that this accident almost invariably accompanies fracture of the lower end of the fibula.

Instances of the displacement of the astragalus from the navicular bone and os calcis whilst the ankle-joint maintains its integrity, are rare; for Mr. Hancock* states that after great pains he has only been able to collect the accounts of three cases of this peculiar accident, and mentions the particulars of a fourth which occurred in his own practice.

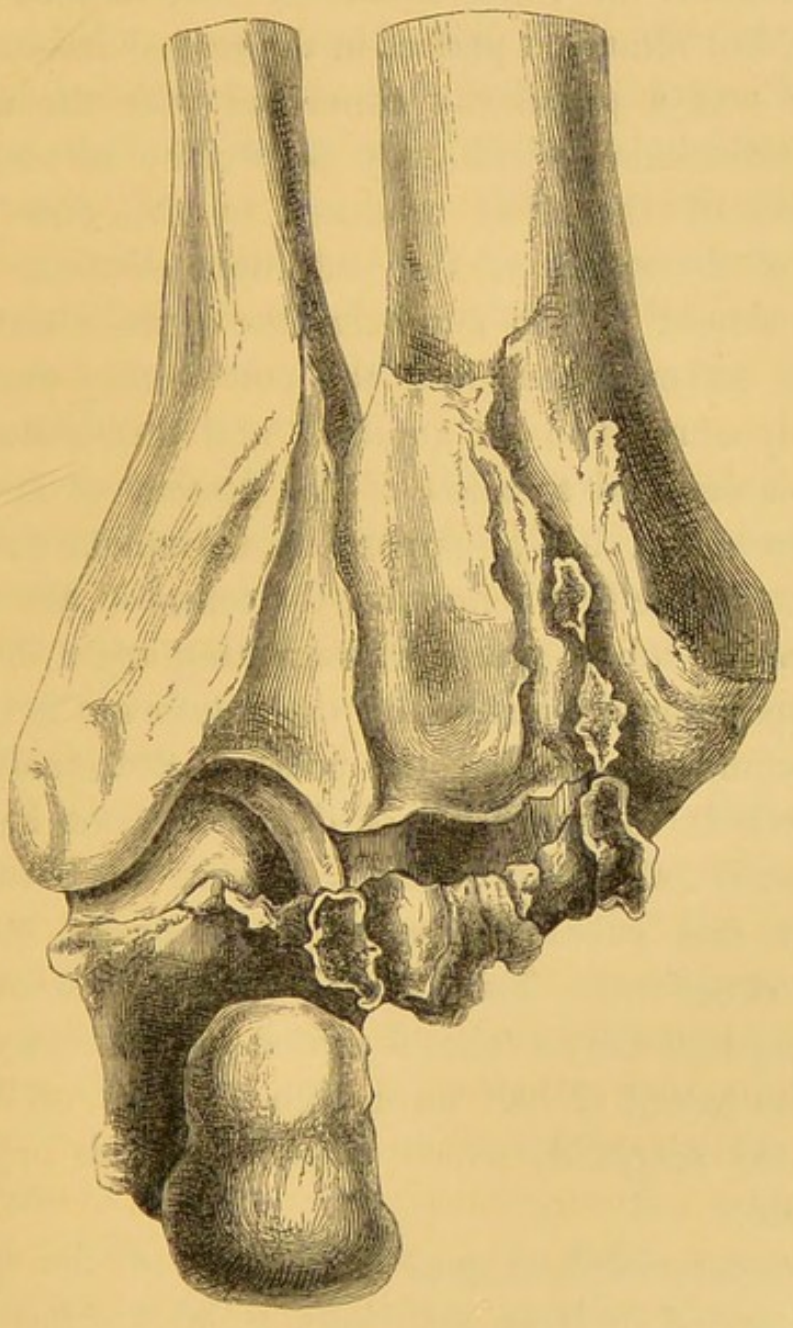
A more unusual luxation still, I suspect, is that of the body partially inwards with the tibia,—the astragalo-scaphoid articulation remaining perfect. I have had the opportunity of dissecting such an example, where the displacement remained unadjusted. The subject of the injury was a middle-aged man, and was brought for anatomical purposes to the Medical School attached to the Charing Cross Hospital. No history of the case could be obtained, and I shall, therefore, at once proceed with an account of the dissection.

Bones.—By admeasurement of the sound foot it was seen that the distance between the lowest point of the internal malleolus and the inner tubercle of the calcaneum was three inches, whereas on the affected side the interval was increased to four inches. The fibula had been fractured two inches and a half above the malleolus: union had taken place, and from this point to the ankle-joint the bone was completely anchylosed to the tibia. The distance between the malleoli on the sound side was two inches and three quarters, but on the opposite side it was three inches and five-eighths. The astragalus was dislocated inwards with the tibia, so that the outer edge of its posterior surface was now in a line with the upper and inner margin of the posterior

* The Lancet, October 1844.

aspect of the os calcis; and that portion of the convex articular surface of the latter bone now unoccupied by astragalus was so fashioned as to afford accommodation for the play of the inner side of the fibular malleolus. On

Fig. 19.



examining the under surface of the tibia, its external half is seen to be deeply hollowed out to receive the corresponding portion of the trochlea of the astragalus, together with the fibular surface of this bone. The margin which natu-

rally separates these two aspects was rounded off, so that a kind of ball-and-socket joint had been established; and the fibula becoming thus excluded from articulation with the astragalus was, as I before mentioned, found applied to the calcaneum. The encrusting cartilage of the tibia and astragalus in these situations was almost entirely wanting, but remained perfect in the rest of its extent.

There was a peculiarity connected with the calcaneo-cuboid articulation which may be worthy of mention, as illustrative of the effect produced by the now unusual bearing of the weight of the body upon the foot. In this joint we should call to mind that the opposed surfaces are naturally so arranged, that the curves they present are conversely adapted to one another; and this mutual overlapping is destined to allow of the descent of the cuboid on the os calcis, but to oppose its movement outward or upward. In the foot before me, the centre of the articular surface of the cuboid presents a retreating angle, into which a corresponding projection of the calcaneum is received; and it would appear that the pressure continually being made towards the inner side of this latter bone had forced the internal half of its anterior surface in between the navicular and cuboid bones, so as to nearly touch the external cuneiform. This view is additionally strengthened on finding that the os calcis is united by soft anchylosis for nearly the extent of half an inch to the facet, on the outer side of the scaphoid, which when present is opposed to the cuboid.

The metatarso-pharangeal articulation of the great toe was obliterated by bony anchylosis, which had incorporated the sesamoid bones found in this situation; the whole being fortified by dense and irregularly arranged ligamentous bands, constituting a solid mass about the size of a large chestnut. A reference to the normal peculiarities of this

joint, the part it plays in the constitution of an arch, and the support it affords to the inner side of the foot in standing, would lead us to expect, I think, that in this peculiar unreduced dislocation its consolidation would become a most efficient accessory means for ensuring support and stability.

I should have mentioned, that from the twisting the astragalus had undergone, so as to have thrown the fibular surface in relation with the tibial trochlea, and the inclination inwards given to the tibia, the internal half of the convex articulating surface of the os calcis was prolonged with a considerable slope downwards, backwards, and inwards, and the facet on the lesser process was depressed below its ordinary level.

Ligaments.—1. *Perfect.*—The three divisions of the external lateral: the superior and inferior calcaneo-scaphoid: the superior astragalo-scaphoid. 2. *Strengthened.*—The inferior calcaneo scaphoid at its outer part was of more than cartilaginous hardness, and of thrice its natural thickness; the anterior peroneo-tibial; anterior and posterior, tibio-tarsal. 3. *Ruptured.*—The interosseous and deltoid most probably; but this point could not be well made out, on account of the surrounding condensation, "the process of restoration depending upon a thickening of parts around the torn ligaments, with effusion and infiltration of lymph, resembling the provisional callus in the reunion of simple fractures."* 4. *Obliterated.*—The inferior portion of the interosseous membrane, consequent upon the anchylosis of tibia and fibula. 5. *Abnormal.*—A dense ligament was found, stretching from the lower portion of the anterior annular ligament over the upper part of the astragalo-scaphoid articulation, to be implanted into the two internal

* Mayo's Pathology.

cuneiform bones, by which means the tendency of the head of the astragalus to start from its socket was kept in check.

Tendons.—Those of the anterior part of the leg were displaced somewhat outwards; but a ridge of bone springing from the front and lower part of the fibula formed a stay to, support and pulley-surface for, the tibialis anticus; the inner tendon of the extensor brevis was curved; the peroneal tendons were placed further forwards than natural; the posterior tibial tendon had become much consolidated; its breadth was much increased, and in being firmly united to the trochlea of the internal malleolus, was twisted, too, on its way to the os naviculare; its turns, however, were secured in position by osseous embankments jutting out from the margins of the canal in which it ran, and it deeply grooved the inner side of the astragalus. The flexor communis was similarly circumstanced, but had been separated from the former muscle to the distance of a quarter of an inch. Its course, however, was maintained as it passed round the astragalus at the inner edge of its posterior surface mainly by thick osseous offshoots from this bone. The flexor pollicis ran in its appropriated grooves, and was in the above-named manner secured there. The internal annular band was much thickened, and as it passed over the tendons was firmly adherent by its under surface to the bony projections spoken of.

Vessels.—The posterior tibial artery, its venæ comites and accompanying nerve, so overlaid the flexor pollicis as to conceal it from view at the inner ankle. The anterior tibial vessel presented a wavy course from the lower portion of the tibia to the toes.

Nerves.—The posterior tibial nerve, as it turned round the astragalus, was somewhat expanded.

Bursæ.—A large bursa, with tough fibrous shreds in its walls and crossing its cavity, had been generated beneath

the bony mass forming "the ball" of the great toe. With respect to the presence of these sacs, it is well known that continued pressure or friction will bring about their formation in the areolar tissue, in situations where no such structure had previously existed; and their origin, I presume, is the same as that of bursæ generally, which, as Mr. Wharton Jones was wont to state in his physiological lectures, "are to be regarded as enlarged interstices of the cellular tissue;" and I may add that Sir B. Brodie, in his work on the Joints, mentions that "they may be resolved by maceration into cellular texture."

Unreduced dislocations in general—It is always instructive to learn the state of parts, and in the vicinity of unreduced dislocations, more especially so when the dissection is made within the limits of a time beyond which the attempt at reduction is set down as hazardous. The bold efforts of modern surgeons have, in many instances, overcome long-standing luxations which in former days would have been regarded as incurable; but at the same time it must be borne in mind that success is not invariable,—nay, that much additional injury has been inflicted; and the records of modern surgery are not unsullied with accounts of the severe laceration of the soft parts, rupture of nerves and arteries, and even of the death of the sufferer from unwarrantably prolonged trials to reduce old dislocations. It therefore becomes important that we should be acquainted, as far as possible, not only with the structural changes and the relatively altered position of adjacent parts which take place in these cases, but be furnished with a knowledge of the different periods of time within which such changes occur, so that a correct judgment may, from a gradually increased number of facts, be formed as to the advisability of attempting

reduction after a certain lapse of time in each particular dislocation.

It is also highly interesting to witness the efforts made by nature to remedy a defect,—to restore those very movements required of a joint from its position in the body, by a series of contrivances simple, beautiful, and effective, and at the same time to mutually accommodate and harmonise the actions of displaced structures in their new localities. Nor is this all: a new articulation may be brought, as a compensation, into greater play, or its anchylosis be secured where increased stability is needed; new materials are laid down and original ones fortified, as means of strength and security, or to restrain the faulty actions of certain parts, whose motions now require control that their capability for support may be the better insured. Bursæ are generated where friction or pressure call for them, and additional offices are assigned to textures whose previous functions were of a more limited character. These attempts at repair are often crowned by the most successful results; and we not unfrequently see that though great deformity remains, its original amount has been gradually lessened, and that, though a displacement is complete, a new and adequate socket has been constructed, with much power and mobility retained. The now unused joint-surface, in accordance with a prevailing law, is obliterated or turned to account by its more convenient adaptation to the position and necessities of neighbouring structures.

REPORT ON A

RARE FORM OF ANEURISM,

WITH OBSERVATIONS UPON THE DIAGNOSIS.

In March, 1847, I was requested by Mr. Chapman, of Hounslow, to see a patient affected with a tumour of the thigh. The following were the particulars of the case:— Mrs. W——, aged 56, and of cachectic appearance, perceived a swelling on the left thigh for seven or eight days previous to seeking medical advice, and fancied that it might have arisen from a slight blow received on the part two or three days prior to the discovery, which occurred accidentally on passing her hand down her dress. So trivial did the injury appear to be, that it gave rise to no inconvenience at the time of its receipt. On further inquiry, however, we ascertained that between five and six months previously she had struck the same part against the corner of a bureau, but no inconvenience resulted. Mr. Chapman informed me that on his first examination of the tumour he found it to be of the size of a large walnut, hard, moveable, circumscribed, and appearing to be solid. It gave rise to no pain, and was destitute of pulsation. There was no redness of the skin; the integuments moved freely over the tumour, the situation of which was at the lower part of Scarpa's space, encroaching on its inferior angle. Tincture of iodine and bandaging had been employed without benefit.

About three weeks from the patient's discovery of the tumour I was requested to examine it, and then ascertained

the above-mentioned circumstances. It had, however, by this time attained to the size of a hen's egg. The fingers could readily be passed a little way beneath it, more especially on the inner side: it appeared to be solid, and was placed directly over the femoral artery,—the skin covering it being slightly raised above the surrounding level. No bruit nor pulsation had been or was now to be detected. A firm band was found to pass from the front of the swelling to the upper and inner portion of Poupart's ligament, and was judged to be the falciform edge of the fascia lata, which had been raised and put upon the stretch by the gradual enlargement of the tumour beneath it. In a few days from this date I again saw the patient, and found a progressive increase, chiefly towards the surface of the swelling, which now gave to the touch a very indistinct feeling of fluctuation at one part. A grooved needle was passed into it, and there escaped a very small quantity of serum, which was immediately followed by blood of a colour between that of arterial and venous. The quantity was trivial, and produced no diminution in the size or consistence of the swelling. The patient being desirous of having the growth removed, I performed the following operation:—An incision was commenced along the inner edge of the sartorius muscle above, and continued over the fore part of the tumour to a short distance below it. Skin and superficial fascia being divided, the tumour was found to be placed beneath the fascia lata, which was cautiously opened to the same extent as the superimposed structures. The swelling being thus laid bare, appeared of a dark colour, solid in the greater part of its extent, but in the remainder soft and destitute of pulsation. I now so far isolated it as to separate it almost entirely from the femoral artery, immediately upon which it was lying, but to which it seemed adherent only by dense areolar tissue; and finding

likewise that it was embedded in the substance of the sartorius, I was obliged to cut that muscle across, above and below, close to the tumour. I should gladly have saved a portion of this muscle, but found that if I attempted so doing only a few fibres could have been preserved, and the operation would have been rendered much more tedious. The tumour was now connected by a short, slender peduncle only to the front of the femoral artery; a slight touch of the knife, with its edge kept close to the tumour, divided this attachment, which proved to be a rather large muscular branch of the crural trunk supplied to the sartorius in this situation, and the injury of which had, in point of fact, led to the production of an aneurism of it in the substance of the muscle. Enough of this branch, from which blood flowed freely, had been saved for the application of a ligature. Another small twig above and unconnected with the disease, required likewise to be secured. The wound healed without a bad symptom, save the retention of the ligature placed on the muscular twig, for several weeks; at the end of which time, showing no disposition to separate, it was cut short, and in two or three days the skin healed over it.

On subsequently laying open the tumour at its fore-part, a few drachms of dark fluid blood escaped from it, and further examination showed that the bulk of it was composed of laminæ and shreds of fibrine contained in a cyst, the layers having the ordinary aneurismal arrangement, and so overlaying and concealing the orifice of communication with the femoral artery, that it could with difficulty be traced. In size and form the tumour might be well likened to a Seville orange.

Observations.—The history of this case presented difficulties which rendered its diagnosis very obscure, but which had led me at first to suspect the disease might be aneu-

rismal; there were, however, too many important signs of that affection wanting to admit of my continuing to entertain this opinion. The swelling had not increased with uniformity; it had never been noticed as a compressible tumour; pulsation was unfelt from the onset; no local inconvenience was produced; it was unaffected by pressure made on the femoral artery above or below it; it could be isolated from this vessel to a great extent, and was freely moveable; its size was uninfluenced by compression, and its consistence had varied in an order inverse of that of aneurism,—viz. having been at first hard and become subsequently soft. On the other hand, the complaint could be traced to an injury inflicted directly over the course of the femoral trunk: its compressed figure, and the forward tilting of the iliac fascia lata, showed its origin to be deeply seated; and these circumstances, together with its concealment of the vessel it was so contiguous to, proved that it must be almost immediately upon, if not connected with, the femoral artery. A tumour situated in the track of a large artery may be destitute, when small, of any communicated pulsation; but when, in its increase, it comes to press more closely upon the vessel, a pulsation is now, for the first time, perceptible. In the present instance, however, this did not occur.

These, then, were unsatisfactory data for the treatment of the case as one of aneurism; yet they were the only ones which might, so to speak, hint at such being the nature of the affection. Had early though slight symptoms been noticed with care—such as ecchymosis, perhaps an indistinct thrill, a little swelling, with subsequent and increasing hardness of it, &c.—some light, at least, might have been thrown upon a case, the real nature of which seemed involved in obscurity.

Upon applying the stethoscope, no thrill or bellows-

sound could be detected in the tumour or in the femoral artery above or below it. This symptom is one, however, upon the absence of which no particular stress was to be laid, inasmuch as it might have been present at an earlier period of the complaint. The consistence of the swelling, when first examined, would mask completely the sound, the return of which might have been expected when the magnitude of the tumour became, in the course of a short time, so much increased. For here, no doubt, the coagula, which prevented the entrance of no more than a very small quantity of blood into the sac, had become detached and displaced, and thereby a larger amount of that fluid had gained ingress, as was shown by the tumour becoming larger and, in part, softer. But when, after all, it is remembered that the aperture of communication with the cyst was exceedingly small, and encroached upon by coagula which likewise occupied nearly the whole interior of the cavity, it is scarcely possible to suppose that a sufficient amount of blood could have entered to communicate to the ear even a thrill, much less afford a more definite pulsation. The absence of bruit in the vessel above and below might show that the tumour did not press much upon it; whilst the great mobility of the latter would lead naturally to the supposition that it was unconnected with the artery.

There were some points of similarity to those which arise from a collection of matter, and especially in this respect,—that the swelling was at first hard, and became at length soft; but the softening, which might indicate the formation of pus, was unaccompanied by a sense of fluctuation, by rigors, by any aggravation of pain just prior to softening, or by throbbing. Exploration with a grooved needle proved, indeed, most satisfactorily, that no abscess had formed.

Was the swelling a hernia? If so, it could only be

of the femoral variety. The following considerations afford a reply:—It received no impulse on coughing; it had passed too far down the thigh to be, at least, any usual form of rupture; the interval between it and the crural ring was free from any enlargement which might give rise to the suspicion that the tumour was continued up to that part. When small it could not be displaced towards that opening, and when quickly enlarged it gave rise to no symptoms of a hernial character.

Having passed in review the above points, so important for consideration in forming a diagnosis, and being led therefrom to regard the swelling as neither aneurism, abscess, nor hernia, I was inclined to view it as an abnormal growth of a solid, and, not improbably, of a malignant nature. The age of the patient was favourable to the notion, and her aspect was characteristic of that species of disease. The tumour had quickly enlarged, when a stimulus to increase—a blow on the part—was applied, and a puncture of it showed much vascularity. On the other hand, no swellings were detectable in any other part of the body; there was no implication of the skin, nor, apparently, of surrounding textures; the neighbouring glands were not in the least degree enlarged; the tumour was not irregular in shape, nor had it ever caused the slightest pain.

I should in this case have preferred waiting longer than I did, previous to performing an operation, inasmuch as no inconvenience, either local or constitutional, was manifested, and time might have developed some circumstance connected with the "growing evil" enabling me to judge more precisely of its nature; but the patient pressed to be freed from the blemish, and delay would only have necessitated the performance of a more tedious operation. I believe the explanation of the mode in which the aneurism

had formed to be this: the blow originally received had ruptured a muscular branch passing from the fore part of the femoral artery directly into the sartorius; blood at the same time becoming effused into the latter, whilst the rent in the small branch remained unhealed. Gradual condensation of the areolar tissue around the outpoured blood then succeeded, and thus was formed a distinct cyst, which communicated, as it laid over the femoral artery, with the twig springing from that vessel. The swelling must (it is to be presumed) have been small to have escaped detection for six months; during which time, however, it might be readily supposed that its size had been steadily on the increase, as the laminæ of fibrine contained within it were, for the most part, dense, with the outermost ones firmly adherent to the sac. Its position —in the substance of the sartorius—presented a certain degree of obstruction to increase, but its tardy enlargement I suspect to be mainly due to the feeble impression made upon the walls of the cyst by blood passing through so small a channel as the muscular artery; and the same circumstance would likewise account for the absence of pulsation, which is generally more or less strong in proportion to the larger or smaller size of the aperture of communication with which an aneurism is connected.

The peculiar form of aneurismal disease under description is of rare occurrence, and I suspect is most likely to be produced in situations similar only to that which this tumour occupied: viz. where a muscle, in overlaying a large artery, receives a branch directly from it. If that branch be ruptured just where it enters the muscle, the continued impetus of the blood passing through it directly from the trunk being inimical to the work of re-union—the formation of a coagulum—effusion will continue to

occur, though to a small amount, into the muscular substance; a limit being, at the same time, set to it by the actions of the muscle and by the structure of the part into which the effusion occurs, but mainly by the feeble impulse the cyst receives from the blood.

THE END.

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