1852

Rachitis

1858

Hamburger Bruecke
Rachitis

Synonyms. Rachitis or Rickets.

The term rachitis was derived by Glisson from the Greek word ῥάκις (a spine) because the spine is peculiarly liable to suffer in this disease, but we are well aware that previous to his writings the disease was known in England by the name rickets, and was clearly described by Whetstone prior to Glisson's work on the subject. Glisson admits that the English term rickets had great effect in inducing him to call the disease by a name of so close a resemblance in sound. The more is so by adopting to rear an approach and at the same time a term to correct as his own was, there could be less opportunity for discussion, or definition, a matter as great as to be avoided in these days as in our own time.

With regard to the Etymology of the English word. Dr. Godd remarks that it is probable that the
Cyclopedia of Medicine. Art: Rickets. page 615.
English word is derived from the Saxon nick or ragg, a
heap or lump, particularly as applied to the back.
This also it denotes in a broad sense, hence ricket
or ricket means lumpy-backed. Since also we derive
hayrick, a heap of hay, and rick as & Johnson has
given it from rick to smoke.

The works of Gliptin, and of his colleagues
Bate and Regenstetter, together with that of another
mentioned above, have fully established the belief
that the disease first made its appearance in the West
of England about the middle of the seventeenth century
and have obtained for it in the continent of the name
and designation of the "English disease," "Hscrus
Anglicus," "Doladie Anglica," "Inglesle Krankheit."

The editors of the Encyclopedia of Medicine stress
this point: "That rickets was never distinctly
described by any medical author before the time of Gliptin
and Gliptin we readily admit; but that it was of such
exact origin as the period stated above, we conclude
to be quite in connectent with the several terms in the
Greek and Latin language denoting deformity
and deceptuation of the human body, and with the
instances recorded in ancient history of persons
as afflicted who were distinguished in various
departments of letters and even in arms."
A good illustration of the former is the celebrated
fabulist Aesop, so well known in our own times from
his writings. Also Hippocrates the witty poet of Greece,
our own King Richard the Third is an admirable example
of the latter.

Rickets is supposed by some to affect
the lower animals also, but we have no true account
of the disease in them, it is however quite certain that
when they are subject to improper, and deficiency of
food and confinement in wet close stables they suffer from
a disease somewhat resembling rickets in appearance.
Cases are recorded of examinations and depletion of
animals is affected. Thus, Lordat described rickets? in
mice; Richardson describes the softening of the bones?
of the toes of the parrot; Dupuy of a rickets? in the horse; John Good
reports that rickets occurs in the bear; and Cocker
has described the disease as it occurs in sheep; and
to take the evidence of farmers and others observant of
the maladies of young animals, we hear of diseases affect-
ing pigs, (called in English crickets) young ducks.
and geese when they are exposed to wet and cold.
Puppies, especially young greyhounds are very liable
thus to suffer and I have myself seen the skeletal of
a young Spanish pointer. These limbs are much distorted
by a disease closely resembling the rickets proper.
Stanley on Sarcines of the Bones 1849 page 217.
of the human subject.

Rickets is especially a disease of infancy, and I cannot fail to meet any case where the adult has been affected with the malady. I am well aware that by authors of comparatively recent date, and I believe by one of our own time, the disease rickets, known (osteomalacia) has been confounded with rickets, but the two are essentially different that we should never be at a loss to distinguish them from the other.

Rickets appears generally during the period of the post-natal time, though there are many cases in which it occurs before that period. I mean that case of the fetuses in utero can be affected with the disease, but these cases are rare. Well authenticated instances are those of Gliess, Berckel, Klein and Eberletter, it has also been observed at birth as recorded by Bordenace and Piel.

In the museum of St. Bartholomew's Hospital says Dr. Stanley, "here is a fetal skeleton exhibiting arickety condition of the bones accompanied by enlargement of the skull from polydactylus". My own observation has led me to conclude, that the disease more frequently shows itself during the period of the post-natal time, between the sixt and twenty fourth
Levick & Jones Pathology. 1834 Page 765.
months after birth. In my observations I found it seldom occurred before the fifth month.

Grenin found that in 346 cases, 260 were affected between the 1st and 2nd years, only were congenital, and 82 occurred 1st between the age of 4 and 14. 46 males and 108 females. As a general rule it may be stated, that should the syphilitic child not notice the commencement of the disease before the expiration of the fourth year, there is little probability of its being developed, but sometimes unfortunately it will occur beyond this period.

When the child is about to be affected with cicles he is observed to become dull and languid, the appetite fails, the bowels are irregular, the stools pale, there is great constitutional disturbance. There is a marked cachexia of the system, febrile symptoms are set up, but these is no true inflammatory state as some have described. The belly becomes tumid, the limbs shrivel, and there is an appearance of the sufferer generally strikingly resembling that of patients laboring under the scrofulous cachexia.

Rachitis is unquestionably a disease of the system generally, affecting certain parts secondarily; it is not a disease of the bones as has been stated by some Pathologists and Surgical writers; any more
Pleurisy, absence of Roser patches in Typhoid fever. A healthy face - it is the effect and not the cause.

The most constant and striking changes are:
1st. Enlargement of the ends of the bones, where the cartilage comes in contact with the dense structure.
2nd. Softening of the liver; 3rd. Thickening of the liver; 4th. Arrest of growth of the parts physiologically related to the bones, not the bones only, but the muscles, nerves, etc.

The most striking but equally important changes are those which affect the brain, the spleen, the thorax, and lymphatic glands, and a decided alteration of certain organs from the state of the thoracic walls of the lungs, heart, and pericardium. The changes we will examine more closely subsequently.

The appearance of the little patient is, independently of the cachectic state before mentioned, very characteristic. He is pale, the head appears enlarged, the features pinched and shrivelled; in severe cases the child is unable to support itself on the nurse's arms, but his back with the face upward in a manner once seen never to be forgotten. (The deformities of the limbs are very striking and will be described hereafter.) The child has an odd vacant expression. Should he be able to talk he is said to be "old-fashioned," and has the agitation,
of being sharp and precocious; but this I conceive to be erroneous, for the intellectual powers are impaired like the rest of the system generally, but the child for being a "weakling" and always in the company, of its parents and made much of, attracts their habits and expressions.

The fact is peculiar, the child either waddles the nurse, for being knock-kneed or hand-clipped, either of which can obtain may obtain.

Anatomical State of the Bones

The enlargement above mentioned which is so peculiar and striking a characteristic of the disease are caused by a depletion of the ground of ossification, and this is attended by the diminution of the evidences in the chest of the lines, the completion of the ossification is arrested in the part affected, while the process goes on elsewhere; great development of the balls of the knee is the result frequently, with enlargement of the layer of cartilage near the bone in which the primary ossification is the line appears, that the disease about cartilaginous with the absence of a due proportion of phosphate of lime is clear by a constant transparency of the epiphyses, the swollen joints which too frequently add to the symptoms.
just spoken of: the swelling depends upon the excitation of a reddened corium into an enlarged cancellous and cellular tissue structure at the same time exhibiting a deficiency or entire absence of earthy content so that on cutting a bone thus affected, the bone meets with no resistance. The periosteum is more vascular than usual, and thickened and pulpy in the external surface of the bone, and this first begins at the point of junction of the cartilage with the bone.

The spongy end of the bone also contains much fat. The cavity increases in size and the walls of the bone become thin and softened.

**Chemical Changes—**

A marked diminution of the earthy matter of the bone appears, at the same time we observe a change in the animal constituents, the cartilaginous framework being also altered in structure, the bone tissue being converted into chondro or gelatine (cf. Land's bone injection—Sherrington's Pathology). The diminution of the bone salts varies according to the intensity of the disease; they may be reduced as low as 10 per cent; it appears also that fluoride of calcium, of which there is an appreciable quantity
Dr. P. M. D. Lecer. Lectures on Herd's Anatomy delivered 1857.

Cyclopedia of Medicine page 617.
in healthy bone, is wanting in sickets. He considers and the Choroplates, e.g. Dr. Zuber, in his relation, all in normal proportion generally, sometimes one or other may be in excess; the same gentleman states that he has when such bones were in excess, and this I am able to verify.

The rapidity with which the bones are softened in sickels is sometimes very extraordinary. Romantkaus observed the whole of the bones in one instance were left in the short space of one week, and he once proved fatal to be preserved in skelton. At the disease advances the bars are readily parted, then even a slight force is applied; and it is wonderful to notice the ease with which they work at this time. Sifted as they are, at length they become completely plastic, like guitti, can be moved in any direction giving rise to the deformities now to be described.

Deformities of the Skeleton.

1st of the Head.

The Strelz is his admirable work on Diseases of the human Skeleton. That is the subject, Child
Stanley op. cit. page 219.

Stanley op. cit. page 220.
The lead is behind the normal plane curves from arrest of its growth. The line of the face, moreover, suffers from the descent to a still greater degree, so that, after all, the appearance of the head leads the casual observer to believe that there is enlargement to a considerable extent, which we before attempted to clear and not the case. The head is unnaturally flattened, the centres of the parietals are expanded to a considerable extent, the forehead is prominent from enlargements of the frontal plane. "The true lips, Mr. Stanley, become thick, prominent, fleshy, Maggie, resembling the texture of good leather cloth." Those of the face, too, seem to undergo one change of development indicated by the character of orange and elongated under-jaw, found in those who have suffered from rickets in early life. The teeth are jagged and uneven, and are lost early, giving an old look to the face, and the process of dentition is protruded. The enamel of the permanent teeth is craggly and uneven (somewhat wooden appearance) though hard enough, showing its imperfect formation. The face during the course of the disease has been found softer than natural. The changes in the lead and face occur together, or may commence and go on at different periods.
The changes, if he head especially, strongly suggest great importance. During the period of the disease, a series of fatal consequences when the process of separation takes place: we may find a train of important and even fatal consequences result, which we shall take occasion to describe adequately.

Of The Spine.

The vertebal column exhibits in a very remarkable manner the changes which the laws may undergo in cases. Oft. from arrest of their development and softening of their texture. The spine is curved very frequently, in the curvature of the curve forward, generally, in the cervical region: if it be very great extent the head of the child is drawn backwards with the face upward. The lumbar and dorsal convexity is in the reverse direction, in this respect presenting a resemblance to angular curvature of the spine. The spines for weeks of the last dorsal and of the lumbar vertebrae are sometimes wanting. The lumbus falls in, the extremity of the lumbar is often unnaturally protruded. Thus the gait of the hunchback, who traverses the seversity of the disease is stiff and formal, and in the same persons the face is directed upwards.

The curvatures from reeling are, according to the Stanley, rare among the children of the affluent.
Stanley p. 618. page 122.
ity occur also nearly equally in both sexes, whilst the
curvature from their causes are most frequent in females.
Curvature also from rickets occur at an earlier
period of life than those otherwise induced which
appear usually in females between the ages of 10
and 16 years. In these latter cases moreover
the deformity is confined to the limbs and spine and
is not therefore accompanied or followed by the distortions
and defective growth in the pelvis and lower limbs
which are the characteristics of rickets.

Here can, however, be no doubt that the vertebral
column may suffer in other ways than the one just
mentioned, but I consider that to be the typical form
although there will frequently occur, varying according
to the power brought to bear upon the spine, and the
different circumstances in which it may be placed.
It is true also that such affection, whatever it may be,
is not always isolated, but may occur alone, or be
complicated with another, as it may also be associated
with deformities in other parts of the skeleton. That
the thorax should be implicated, whereas the dorsal
vertebrae of the spine are affected can be easily
imagined, by reflecting upon the relation which it
kears to the cavity of the thorax, as well as to the
ribs and sternum on which it forms.
Scrivener & H. Jones, op. cit. page 759.
Of the Pelvis—

The pelvis is small from the uterine portion to its forna, and remarkable changes occur in its form, from the yielding of its bones and ligaments. The distortions which it undergoes during the process of childbirth constitute a subject of much importance; it is seen clear: that consequence in the act of parturition, and the effect which the have upon the health and life of the woman female, ought to be borne in mind by every practitioner, and should stimulate him to have a special regard to the prevention of pelvic deformities in the child.

A sort of natural protection, says Pecce, seems to be afforded to the pelvis against the violence of accidents; for numerous instances are recorded in which individuals with well-developed cachectic or their two extremities and spine escaped an destruction of the pelvic bones; at the same time this gentleman obverse, in the first sentence, "with few exceptions the irregularities of the pelvis are due to accidents, they are caused by lateral contraction, by an approximation of the acetabula, by auton postmori or removal for a case of the sacrum, or by an asymmetrical deformity due to an arrest in the growth of one half of the pelvis.

I am inclined to think the most common deformity is the one pelvis, the acetabula being
For apart, an increase of the lateral measurements, with a diminution of the antero-posterior diameter, results. The rear ilia are widely separated from each other; sometimes the sacral promontory projects. Sometimes it does not; it may occur to such an extent as to give the pelvis the shape (whence the name) of a kidney, from the closeness of the iliacs with the sacrum. The inclination is considerable, sometimes it is very erect; sometimes the inclination of the sacrum does not reach it. The pelvis is sometimes triangular from approximation of the rear ilia, and acetabula, with increase of the antero-posterior diameter, but the deformity is not frequent as a consequence of accidents, though it is the most common deformity in multiparous women.

The cause of the deformity, says Mr. Dinsley, is to be attributed to the pressure which the heads of the thighs make through the acetabula upon the front wall of the pelvis, constantly tending to approximate it to the posterior wall, and tend to give the front wall the flattened form which is characteristic of the female pelvis. The hollowing of the loins (before described) which is also a character of accidents, is a consequence of changes in the position of the sacrum produced by the weight of the spine and parts around. The head and upper limbs constantly leaning downward upon
With few exceptions the malformations of the pelvis are due to accidents in early life, they are caused by approximation of the acetabula causing lateral extraction, autotropism extraction for advance of the sacral eminence; to irregularities in shape or irregular development and asymmetrical forming due to arrest of the times constituting one half of the pelvis.

Extracted with one of the deformity to be mentioned affect the pelvis (as before mentioned) are very common and fatal to the child. From this indeed it generally seems to entail, in the female, an amount of danger and suffering to herself and offspring much to be deplored — and difficulties in parturition frequently the cause of much terror and often unmerited approach to the medical attendant.

Of the Thorax —

The deformities of the thorax are in their nature such from their important pathological results peculiarly of great importance in this disease.

The back presents a flattened appearance due to be in great measure to the accumbent posture.
The ribs, independent of any marked change of structure, suffer considerably after birth and online. Looming more or less flattened, and being more or less turned on their axes, according to the diascetic of the vertebrae, are frequently attached a section of their bones where they join their cartilages, all the ribs from the 1st to the 10th, the 11th and 12th escape entirely from...
frequently, a retraction of the ribs above they with a corresponding prominence below will be observed. Strictly we shall find that where the retraction is the greatest, the convexity of the thorax will be most increased ed upon.

The thoracic deformity, I believe, most frequently, due to atmospheric pressure, so as to make observations, that the diaphragm descends further than the air enters; the ribs are thereby exposed to a pressure which they are unable to resist, hence, and finding no counteracting pressure active, the deformed and churned state of the thorax results; when the soft parts within push out the thoracic walls, they have not the same tendency to expand. Here we observe over the heart, and liver.

In some cases, where the ribs are raised and flattened, and the lower end of the sternum instead of being drawn up is absolutely forced out from the ribs being shortened from defective growth. The thorax assumes a more globular or barrel shaped form. But these cases are rare.

(of the upper extremity)

The scapula, like the rest of the flat bones, may suffer in the same manner as they those of the skull
May follow the declination of the spine.

The clavicle is bent at an angle due to the weight of the upper extremity being in great measure borne by that bone. The curvature, which is sometimes converted into an acute angle, takes place at the clavicular origin of the sternomastoid muscle. The extremity of this bone, like those of other long bones, possess the same enlargements and like deformities.

The humerus is bent at an angle, the convexity being downwards, the seat of the deformity and being generally at the insertion of the deltoid, arising from the action of that muscle, and from bearing its own weight and that of the fore-arm.

The radius and ulna are often the seat of excruciating deformity, being twisted as well as curved. The extremitas of the bone are much developed and enlarged, the hands and fingers generally escape deformity.

Much will depend upon the position in which the part may be placed when the bones begin to assume their strength and form.

As a general rule it may here be observed, that if the ribs have not made their appearance before the child begins to walk, then too late will probably escape in part, but some degree of deformity generally will be found to exist.
Listed by M. Stanley Op. Cit. page 228
The lower extremities may easily be imagined, from having to support the weight of the body, are most prone to suffer from all the excessive deformities to which the disease is liable, and in many cases (though according to the statement of Dr. A. Farre, there are exceptions to this rule as sometimes the pelvis and lower extremities escape entirely, while the upper ones are affected), we find the disease shows itself in the lower extremities alone: the bones generally are shortened, ill-developed, flattened and variously curved while the epiphyses are enlarged.

These deformities take place even though the child be not permitted to attempt to walk, the deformity being almost always an exaggeration of the natural curve of the bone. The femur is bent with the anterior forwards and upwards, the femur occurring more often if the child be allowed to sit upon a chair only, and then rises. In large backed children the femur is not so frequently bent with the convexity of the deformity downwards. The tibia and fibula are also bent generally in the same direction but they may be bent upwards. Sometimes from relaxation of the ligaments the knees are thrown together and
forwards, and the feet outwards, presenting the appearance so well known as in-kneed or knock-kneed.

Osteo-my-sphacia is also strongly marked in the lower limbs. Characteristic of want of development as well as dilatation - the articulating ends of the bones are enlarged, as before mentioned - the upspringing of the deformities of the upper extremity.

Thus a great weakness and feebleness of the muscular system, at the time when the child should begin to walk we see them (if not prevented which they always should be) crawling along the ground with the feet turned outwards, dragging the lower extremities after them, the internal malleoli resting upon the ground. This mode of locomotion is very painful to undergo, and at the same time very characteristic of the disease.

As before stated we said that the internal organs suffer more or less in this disease. Let us consider briefly how they literally are affected.

If the Brain.

The white matter of the brain is found to be increased in the anterior lobes, in other the grey matter did not exist in its normal proportion: sometimes the white matter is
increased, when this is the case we observe a corresponding
increase in the antero-posterior diameter of the head,
the forehead projecting; but the increased size of the
brain is not infrequently due to collections of
fluid in the ventricles, a similar state of matters
obtaining at the base of the brain and in the spinal
canal. The whole nervous system is defective; the
children, as far as my observation has led me to conclude
(as before stated) are not preternaturally acute, as
some have stated, but in many cases are even especially
deficient in intellectual power. They are particularly
liable to be afflicted with laryngeal stridula,
convulsions, and nervous disorders in after life especially
epilepsy.

Of the Lungs

The lungs, from the deformities of the thorax, are
frequently driven out of their normal position. They are
liable to collapse from the pressure to which they are
subject; emphysema is of very frequent occurrence.
The dilatation of the air cells being caused by insensibility
naturally of some part of the parietes of the chest,
affected by collapsed state of the portion - the
pleural cavity after death is frequently found filled
with a conoid or bloody fluid, with adhesions, the
results of pain inflammation of the heart.

The heart is generally found affected in those who die during the progress of the disease, but the right side is liable to suffer in after-life from the obstruction to the circulation through the lungs which may occur. The pericardium has a whitish patch upon it from pressure and friction, where the apex of the heart has impinged upon the depressed ribs. This patch is generally limited to the apex of the abdomen.

The abdomen is generally tumid and prominent. The proof of retention imperfectly carried on to a greater or less degree. The liver is enlarged, and not uncommonly by its pressure cause aches. It is often found infiltrated with a fatty, looking matter which has been stated by some to be so, but the deposit is albuminous and not fatty.

If the spleen—

The spleen generally is large, pale, and flabby, and felt easily below the margin of the ribs. Its capsule is frequently thickened, or a mass of white or purple has been observed in this disease.

If the Thymus gland—

The thymus is enlarged, or rather does not shrink.
so much as to cause a bulging of the sternum behind which the gland will be observed.

There is also general enlargement of the lymphatic glands, but not to any great extent, they are flattened or round, and have a peculiar feel, well described by the term "warty." They are pale in color, the depot where they are so affected, consists of the same albuminoid matter as that neuterized when speaking of the liver.

Children are sometimes fat, sometimes of ordinary bulk, sometimes the reverse to the case; it is when the latter condition obtains that the yellow and lymphatic glands are the seat of albuminoid infiltration.

The vessels are frequently pale, soft, and flabby. The transverse striæ are very feebly marked, no trace however of fatty degeneration has ever been found in them.

Pneumatocoele occurs under two very different conditions, so we are unable to lay down any particular circumstance as influencing its occurrence. It may be due to injury, most probably to a diversity of causes.

The disease has been observed to be endemic in
Cyclopedia of Medicine 619

Shocking and A Drugs of. Cit. page 751
some peculiar localities, probably from their mode of clothing, and from the unceasing and misery of their habitations. And it has been considered and described by Hahnemann, witness also are recorded where it has assumed the same character in Germany.

This is found among the children of the middle classes, and the wealthy and able, enjoying every advantage which good air, food, and nursing can bestow, equally with the children of the poor who are watered dwelling in low damp unhealthy habitations with bad air, food and clothing.

Among the former it must be attributed to some hereditary taint, and as frequently observed in the whole parents have suffered from gastric, epithelial, or other cachectic states; it has been endeavoured by some to trace to some modification of the vegetable, but I am inclined to think without any analogy between the two affections. I never in my practice of such opinion, on this point however, there is much diversity of opinion at the present time. I am inclined to say that he considers it to be a constitutional disease of the same family as scrofulous tubercle.

The existing cause is most frequently, as Parke Miller well described, "one of the debilitating accidents incidental to childhood as ubiquitous as one of the best..."
of malignant disorders, there is connection.

As has been before mentioned, the disease may be very rapid and acute in its progress, the suffering extending over the long, easily fractured, the child may die early from the matter affecting the lungs, or from the disordered state of nutrition, caused by peritonitis and ulcers of the abdominal viscera, or from the hectic and diarrhoea which are so commonly attendant upon the acute form of the disease.

Most of the children born with the disease, or first affected soon after birth, rapidly perish, and those who escape die in most cases be afflicted with the deformities before described. Unless the disease can disappear or yield to treatment before the 7th or 8th year of the individual, if he survive, will most probably be condemned to a life of deformity which is seldom prolonged beyond middle age. Such persons suffer accordingly from the unnatural position and displacement to which the organs of the chest and even the most important of those in the abdomen are more or less subjected. The stomach may be pulled down as low as the umbilicus, and even the uterine functions have been disturbed by a projecting vertebra pressing upon the kidney.

These unfortunate individuals are remarkable for their shrill voice, dilated nostrils, and panting.
preparation, and life is generally cut short by one of the phlegm of pulmonary disease to which they are so prone."

The appetite in many cases remains keen, though at one it is much impaired; the bowels are sluggish. The urine is sometimes clear and healthy, but more frequently thick and turbid, and depositing a copious precipitate of lithate of ammonia, with a large amount of Phosphate indicating great disorder of the digestive and accumulative functions.

Should the little patient escape the influence of the disease and its complications we find at an early or later period that nature steps in to the rescue, and initiates a reparative change in the bones which is very beautiful, though at the same time not un frequently of a dangerous nature. This process may be accompanied by a marked febrile attack, which is not un frequently accompanied by a cutaneous eruption; sometimes the child at this period exhibits an extraordinary longing for some particular article of food or other substance as well.

After the reparative process begins the bones acquire a degree of strength and solidity even greater than natural, and there are many instances recording the extraordinary power and activity of, dwarfs who have suffered in childhood from rickets. The deficiency of earthly salts, which...
previously existed, it succeeded by an extensive excretion of bone matter constituting in some extreme cases the affected cranial bones, of which there are some curious examples, as well as complete duplication of the skeleton, cartilage, ligaments, and joints being all converted into bone, with all sort of carious growths in the form of horns and the like.

This process of repair leads to thickening of the flat bones and, as before mentioned, the intellectual faculties of the individual may thereby be entirely impaired, and his life become a struggle for the mere preservation of those which may occur from the reparative process causing thickening of the cranial bones and consequent contraction of the cranial cavity. There can be no doubt that this is the cause of many cases of idiocy, and especially of that form to which Ectaniem leads.

In some instances the thickening of the brain affects the capacity of the brain, and if the brain has been narrowed, a mental insufficiency or mental deficiency in epilepsy.

A peculiar form of disease of the cranium has been described by Ellison as occurring in women and characterized by thickening, coarsening, and perforation of the scalp. The bone is atrophied, left, and porous, and numerous openings are observed along the lambdoid suture and in the body of the bone, with the exception of the
In a state of partial insensibility, the perforation may amount to as many as thirty, and in place of the lysis, filled up only by dura mater and pericranium which are adherent to the brain. This disease is not necessarily fatal, and in half an hour to die with symptoms of cerebral and spinal irritation.

I may be allowed here to remark upon the great dependence of our knowledge as to the pathology of epilepsy, and that I am much struck by a remark made a short time since in a clinical lecture, by Dr. Laycock to the effect that it may depend upon a mechanical disarrangement of the flow of the venous blood within the cranium, particularly in the large veins. We see that the pericranium is liable to suffer greatly being thickened and otherwise affected in sickness; how far may the subsequent elevation of the veins be influenced during the operative process which nature sets up in the case of cases? It appears, says Dr. Laycock, that the dura mater is capable of a chronic form of inflammation in childhood leading to hyperplasia and conversion into fibrous ends such a condition has been found by Tisselli & Davis, who have marked by symptoms of cerebral angioitis epilepsy.

The point of view of the case exhibited in the superior longitudinal sinus converted into a hard end, the vein in connexion with which was filled with coagula.
The blood. The walls of the cavities were thickened, dense and of a yellowish color, it contained a clear elixir, as further color was discovered in the cranium. The symptoms in this case were epileptic form.

To return. The swelling of the joints subsides, the distortion of the limbs may be much diminished or even removed, if, should this not take place, a defect in the result of such a kind and nature as to act as an

compensatory manner to correct the inactivity and give

the poor patient a limb seepor for the ordinary purposes of life.

The supplementary provision of a vertical section of a long tone to be chiefly in the opposite side, so that the rest of the bone may present ample and stable the

thickens of the opposite side. the structure at the same time is very free and the texture of an ivory nature.

The landlords of the seckel bone must then compensate

for the curvature and, so uncompressible to the weight which it has to sustain.

Mr. Stanley says that the arrangements of the bony

structure just described are certainly calculated to give

strength to the bent bone in the direction where it is especi-

ally wanted, and it is difficult to avoid the conclusion

that this is their special purpose.

Treatment.

As we have been the show that inspire air and
Improper or defective nutriment are probably the most injurious causes of rickets, and it is evident our treatment must be directed to their removal and the placing our patient in the position most favorable to his cure.

During the existence of the febrile attacks, the tepid bath, warm bathing, caloric fumes, an indicated bleeding has been recommended by some, but this is not think an error. The diminished secretion and defective appetite are to be removed by small doses of the hydrocyanic acid and the bile, together with the Pulvis Rhei Comp. or Pulvis Rhei et Lec. with an occasional mild purgation as St. Ailoe in the Insectie Bonda, if the child be affected at an early age changing the milk, or removing altogether in the breast advanced. Early weaning is advisable but there be any signs of tendency to the disease or contracted sucking is certainly one of the distressing causes which predispose to rickets. After the child has been weaned, the diet should be nutritious and light, given regularly in small quantities so that the digestive apparatus may not be fatigued nor the alimentary canal loaded with indigestible matter, which will be sure to cause phthisic treatment.

This are of great service; then the system will bear it cold or tepid bathing, especially arnica, picric, the sulphate of bismuth, Epsom salts, Calomel, the vicious juice and aloe, all the various preparations of iron with
Here it will be advantageous to combine the alkaline earths and alkalies at soda, ammonia, or Potash & Magnesia; dilute Phosphoric acid, and Phosphate of lime are also adopted by some to be of service. The patient should have previous exercise, care being taken that the body does not remain too long in one position. The various kinds of invalid chairs used are well adapted to this purpose. The child should be covered in the same as little as possible, and it is impossible to avoid distortion and deformities if that is persevered in. The clothing should be warm and dry. The apartment dry and well ventilated, oxygen or oxygen should be obtained if possible. The bed should be smooth and tolerably firm, the head but little raised. The bedclothes light but warm. The same rule as to the child remaining to lie in the same position. However in every instance, whether awake or sleeping in which it may be placed.

Mr Stanley recommends free action of the muscles round the affected side, and states that this is certainly followed by an increase in its strength.

As soon as the child begins to appear well, and the bones acquiring renewed strength and firmness, efforts should be made to return them to their normal state of shape by such mechanical contrivances as shall give them the best support with the least constriction and...
Ride Stanley, Sciences of Bone, page 331
Confinement. Much good is to be accomplished by moderate but continued pressure directed against a bent introduction of the joint for the object of regaining its right form and position. Barnby subsequently adopted a plan for the removal of this crease of deformity which consisted in placing the child in the upright position, and making pressure upon the sternum in so to incline the out-pair character of the chest, and to face out the nose to this natural position. The operation is to be frequently repeated. I am not aware that the mode of treatment has been adopted in England.

With regard to mechanical support it must be borne in mind that neither by its action nor weight should it obstruct the free action of the parts to which it is applied. In this way the apparatus must be constructed and applied that it can be worn without hindrance to the natural movements of the parts. At the same time the effect and action must be continuous and unmitting. The latter must be very gently divided so that at the instant the apparatus is removed the muscular aided by the elasticity of the other tissues surrounding the affected joint rotate will begin to reproduce the distortion and this evil tendency will continue long after the apparently perfect restoration of the part to its right form and position.

I shall finish this dissertation with the following paragraph of Mr. Stanley's admirable
Stanley et al. page 232
Chapter on the subject as his desire of the bones.

There is, however, a limit to the capability of restoration in the vicinity of the joint. Although it be true, that the bone which is bent, and even in a greater degree from the cramps of its texture, can be made to change its natural figure; yet, when the altered form is such as to imply something beyond mere mechanical agency, it is to be expected that the distortion will be permanent—such, for example as the thinning of the bodies of the vertebrae, from the pressure they have suffered, or, from the same cause, the altered form of the articular end of the bones of a distorted joint; for these changes are the result of a vital action in the part, and there is no evidence to prove that a bone thus altered, can be remodelled into its natural form and proportions. Accordingly, the curvature of the sickly spine will be permanent, unless accompanied by thinning of the bodies of the vertebrae, and the distortion of a joint will be permanent, when accompanied by change in the configuration of its bony.

[Signature: Dr. [illegible]]