Pulmonary Hypertrophic Osteo-arthropathy

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The disease, termed Pulmonary Hypertrophic Osteo-arthritis, which has quite recently come before the Medical world as a morbid state, - distinct from, but bearing a close resemblance to Acromegaly, presents in its clinical aspect, and its relationship to Pulmonary Diseases, special interest.

During the time that I was Resident Medical Officer at the North London Hospital for Consumption + Diseases of the Chest, I had the exceptional opportunity of meeting with a pronounced case of this disease.

In my searches through the London Hospitals and Infirmaries for other cases, I discovered one at the Paddington Infirmary, - though of a less pronounced character, - still, in my opinion, an early condition of the same disease.
I have made a careful study of this disease or morbid state, and here give, firstly, the results of my investigations into the clinical condition of these two patients, with photos to, and, secondly, a general outline of the disease with a summary of all the recorded cases — numbering 61.

I am indebted to Dr. J.R. Walters, Physician to the Hospital, for permission to investigate the first case, which was under his care, and also for his suggestions as to literature bearing on the subject.

To Dr. Hillier, Medical Superintendent of the Paddington Infirmary I have to express my thanks for permission to investigate the second case.
Case I

James Masters - aged 34.

Occupation. From the ages of 9 to 14, travelled with his brothers as an acrobat. Since that time, has been an umbrella frame maker, in which work there is a good deal of dust.

Born at Coventry, where he lived for 5 years. He then lived in London for 7 years, when he was not on tour, and after this Dublin for 8 or 9 years. Since the age of about 21 he has lived in London.

Married at the age of 16. (his wife being also 16)

Place of Residence. 8 Silcot Road, Camberwell S.W. He was admitted as an In-patient to the North London Consumption Hospital on July 11th, 1895, but for three months previously had been an Out-patient.

Complaint

Pain in the back, running down the spine - and also in both sides. Weakness, and inability to stand for
any length of time.
Enlargement of Hands + Feet, and inability to use them.
Cough - most troublesome in the early morning, bringing up a moderate amount of phlegm.
Shortness of breath, especially on exertion.
Duration of Illness.
Patient states that he was quite well till February 1894, and dates his illness from about that time.

History

Hereditary. Father alive + well - at 72.
Mother died a year ago - at 75, as the patient says from Influenza.
Previous to this, she had very good health.
Brothers. 4 - all older than the patient, alive + well.
Sisters. 3 older + 1 younger, all alive + well.
No family history of chest trouble, or of any enlargement of hands and feet on either the Paternal or Maternal side.
Wife at 34 alive + in good health.
Children. 5 alive + well, 3 boys + 2 girls, the eldest aged 17, the youngest 3½.
The wife miscarried twice, once between
the 1st + 2nd child at about 3 months, and again between the 3rd + 4th child at about 3 months.

Habits as to Food + Drink.

For the last 3 1/2 years, patient has had poor food — i.e. for 2 years before the illness began, + during the illness, and especially the last 18 months he has not had sufficient food. Has drunk both beer + spirits, but always moderately, though on one or two occasions he has been drunk, or 'had a glass too much'.

General Surroundings at Home (Camberwell).

The patient lives in a ground floor flat, consisting of two rooms and a kitchen. The ventilation of these is very bad. Surrounding the house he has often noticed bad smells — and the Sanitary authorities have found fault with the house. The drainage was found to be bad and last year new pipes, and a manhole were put down.

At Work. Patient worked in a large room together with six others. He
says the ventilation was good, and he
never had experienced any inconvenience
from stiffness, or bad smells, nor
was the place draughty.

Previous Illnesses.

Beyond children's diseases
of which he had - whooping cough, measles
and scarlet-fever - and ordinary colds
says he has always had very good health.

When 18 years old, he had a slight
'touch of rheumatism' in the joints of
arms + legs, which passed off after
two days rest.

There is a history of Gonorrhoea at
the same age (18) when he was in
Dublin.

Previous Accidents.

When a child he lost the
terminal phalane of the Index finger
of the Right hand - through being
crushed in a door.

When 12 years old, broke his nose +
cut his forehead - both from a fall.

At the age of 20, ran a rusty nail
into the joint between the 1st + 2nd phalanges.
of the middle finger, of the Left hand, which suppurated, and has left the joint stiff and enlarged ever since.

Present Illness.

The illness apparently began very insidiously, for the patient says that at the commencement of February of last year - 1894 - 18 months ago - he was quite well, and had noticed nothing, but towards the end of the month he began to feel ill.

The first thing he noticed was a slight pain in the left side, the pain being of a dull aching description, and situated over the position of the Spleen. This lasted a few days, then entirely left him. He continued his work during this time. About a week after this he again complained of pain, more intense, but situated more at the back, and especially between the two shoulders. He continued his work as umbrella frame maker for sometime but was not able to work so well as he usually did.
He found that standing for any length of time tired him. Following this, he noticed some difficulty in walking, the legs seemed to get stiff, and weak, especially the knees, which he was unable to move freely.

He gave up work owing to the pains in the back getting worse, and on account of these he found it difficult to sit up. He then stayed in bed. The pain, when he was standing, or sitting, seemed to drag him to the right side.

After a week's rest, during which time he had been treated by his club doctor, who, as the patient says, told him he was suffering from "cold on the kidneys," he tried to work again. The pain at times was better than at others, and he was able to work, on and off, up till October 1877.

During the time that he was in bed with the pains in the back, his wife noticed that the back was not straight, or rather that one bone stood out more prominently than the others.
From the commencement (February) he had had a slight cough. During March and April this became worse, and he went as an out-patient to Westminster Hospital, continuing there for two months. The Physician, who examined him, expressed a fear that he was consumptive, but no complaint was made by the patient, nor did the medical attendant make any remark on the condition of the lungs at this time. Patient during the summer months was somewhat better, and continued his work fairly regularly up to the end of October 1894. About this time the pains in the back became decidedly worse, and also the cough. The pains then were of a dragging nature, running right through from the stomach to the back. Walking became quite painful to him, and rapid walking was impossible, partly on account of the pain in the back, and partly from shortness of breath. During November (1894) he first noticed
some enlargement of the wrists—both apparently simultaneously—especially did he notice this in the position of the Styloid Processes of the Radii. Previous to this there had been no pain in the wrists, or in any of the joints, with the exception of some stiffness of the knees before mentioned. Soon after this, or almost at the same time, he noticed that he could not shut his hand properly, and so was unable to grasp things. (Up to the end of October i.e. about a month previous to this he had been working with small tools & had found no difficulty in holding them). He also noticed that his hands were getting larger. He cannot remember observing which part of the hand proper became enlarged first. The hands continued getting larger, and about Christmas (1894) he noticed his feet were quite large—and like his hands—and also the knees were enlarged.

All this time he was able to walk
about a little, though the stiffness and pain, which had now appeared in the knees, prevented him from doing much in this way.

After the hands and feet were swollen, he had slight pains occasionally in them, but not of any moment.

During the time that the hands and feet had been getting large, his cough was very troublesome, and he was bringing up a good deal of phlegm, especially the first thing in the morning.

The phlegm, he says, was thick and yellow in the morning, but became less thick during the day. Very often also, the phlegm was streaked with blood, though he has never brought any blood up in large quantities.

During all this time he states that he was losing flesh, chiefly he thinks of the arms, but also generally.

These conditions continued, the hands getting larger up till February (1895), since which time, he thinks their condition has been stationary.
During the very cold weather of January and February (1895) the cough and expectoration were very troublesome, and on several occasions the latter was streaked with blood. The patient says that he has noticed no difference in the form of his face.

In April (1895) he became an out-patient at the North London Hospital for Consumption & Diseases of the Chest, and remained as such till July 11th 1895, when he was admitted as an in-patient.

During the time that he was an out-patient, the man says that his cough got very much better, and the expectoration less.

State on Admission

Height 5ft 5in. Weight 8st 6lbs.

The patient a fair, somewhat short ill-nourished man, with rather a thin drawn face, walking with a decided stoop, + stiffly.

The muscular system on the whole fairly well developed, but certain muscles
are very markedly wasted, - especially the Biceps on both sides, which are noticeably diminished, - in fact, they are almost absent on general view.

The Pectoral muscles are wasted somewhat, as also are the Biceps, - though, neither to the same extent as the Biceps.

The muscles of the lower limbs do not show any marked wasting.

No obvious morbid appearance such as Droopy, Cyanosis, or Jaundice, but marked enlargement of the hands and feet. (vide infra).

Evidence of Injury.

At the junction of the Right Frontal and Parietal bones, at their inner angles, there is a white parchment-like scar, oval in shape, measuring 1 in by ½ in. which he sustained from a fall when an acrobat.

The Nose is deflected to the Right, slightly, this being also due to a fall on examination of the Nose, the Septum of the Nares is seen to be deflected to the Right.
On the hands, is the evidence of the injury sustained when a child—
the loss of the terminal phalanges of the Right Index finger, and the
injury at the age of 20, the stiff and enlarged joint between the
1st and 2nd phalanges of the Left Middle finger.

On both legs is a number of small round parchment-like scars, those round the ankle being surrounded by brownish pigmentation.
The patient had never noticed these before, and does not know their cause.

Respiratory System

The breathing is of the Diaphragmatic type, and is fairly regular.
Frequency, 21 in the minute, but on exertion, or when the patient has
been walking upstairs, the frequency is increased to 32.
On taking a deep breath, there is some pain on both sides, but with
ordinary breathing, or when the patient
is resting, this is hardly noticeable.
The cough is somewhat troublesome, especially during the night, and early morning when he awakes, at which time he brings up a good deal of phlegm, but during the day, he expectorates very little.
The sputum to the naked eye, is thick, soft and moderately tenacious. No signs of blood stains (though the patient says that sometimes it is stained).
The microscopic characters of the sputum are:

Absent, after oft-repeated,

Tubercle Bacilli, and thorough examination by

Ziehl-Neelsen’s method.

Blood ....... No red corpuscles.

Pus .......... Cells abundant.

Scanty: a few Squamous,

Epithelium, and Columnar cells, the

majority in a state of disintegration.

Debris ...... A relatively large quantity.

Examination of the Nares, the patient is found to breathe with greater freedom on the Left, than on the Right side.
The Septum of the Nares is noticed to be markedly deflected to the Right.

The Posterior Nares - free - nothing abnormal detected.

**Pharynx.** The Right Palatal arch is smaller, and lower in position than the Left.

The back of the Pharynx is seen to be somewhat granular, - and the veins are enlarged, and stand out rather prominently.

The Palatal muscles act well.

**Larynx.** No alteration in voice.

No pain or tenderness.

Examination by laryngoscopic mirror shows the vocal cords normal in appearance, and acting perfectly.

**Inspection of Thorax.**

The Left shoulder is on a higher plane than the Right.

There is a slight lateral curvature, with convexity to the Left in the Dorsal region, - the 3rd + 4th Dorsal Vertebrae being the joint most to the Left, - and to the Right in the Lumbar. Associated with this there is a Kyphosis, - also in the Dorsal region, - most marked at the 3rd + 4th Dorsal Vertebrae, - the 4th being the more prominent of the two.
No movement in the whole of the Dorsal Vertebrae.

Anteriorly, some flattening is seen at both apices, above and below the Clavicles. though, this is more marked on the Right side.

On telling the patient to take a deep breath, there is very little movement noticed in the extreme upper ribs, or the extreme lower.

The Costal Angle is increased in comparison with the normal.

Palpation of Thorax.

Vocal Vibration is increased at both apices, above and below the Clavicles, but is more marked on the Right than Left side.

From the 3rd rib on the Right side, down to about the nipple, the Vocal Vibration is fairly good, but on a level with the nipple, it is diminished, and below the nipple is almost absent.

On the Left side, it is fairly good below the 3rd rib, (with the exception of the cardiac area), but at one part in the anterior axillary line, about the 4th, 5th, 6th ribs, there is an area of about the size of the palm of the hand, which is decidedly increased.
Percussion of Thorax.

On the Right side, - slightly impaired note, and higher pitched, in comparison with the Left, - at the Clavicle and above. Below the Clavicle, to about an inch above the nipple, - the note is somewhat hyper-resonant. Below this again, - that is from about an inch above to two inches below the nipple, there is a dull note though not absolute. Posteriorly, - somewhat impaired at the apex, - then good note to the base, - the lower part of which, is again somewhat impaired.

On the Left side, - a fairly good note all over front & back with the exception of the area described under "Palpation" to the Left of the Left nipple where the note is decidedly impaired.

Auscultation of Thorax.

On the Right side, at the apex the breathing is very harsh, and higher pitched than the Left. Under the outer end of the Clavicle, the breathing is tubular, with whispering pectoriloquy - From the 2nd space downwards, the breathing is harsh, with crackling râles of medium size,
but inconstant.
At the base anteriorly, the breath sounds are weak, and big constant râles are heard, especially with a deep inspiration. Posteriorly, at the apex, breath sounds harsh, and expiration prolonged. At the base, some coarse râles and phonchi are heard. The heart sounds are conducted round to the back, along the dull area at the base. On the left side, the breathing is harsh all over, but not so high-pitched as on the right. In the upper part, especially under the clavicle in front, and the supraspinous area at the back, there is a slight catch with inspiration—tending to cough.
All over the left front, some very fine crepitations are occasionally heard. In the dull area to the left of the nipple, these crepitations are constant and larger. At the left base, there are distinct coarse râles & phonchi.
The heart sounds are conducted all over the left side, back and front. The Respiratory Capacity of the patient, as tested by the Spirometer, was 72 cubic
General Aspect and Morbid Appearance.

Under this head, we find the characteristic and pathological conditions of this disease. In this patient, the hands are extremely large, especially in the fingers, which are greatly increased in size. Above the hand proper, the wrists are strikingly enlarged, even in comparison with the middle of the forearm. The elbows appear to be slightly enlarged. The shoulders and upper arms do not show any apparent increase. Again, the nails of the fingers are remarkably enlarged, even for the big fingers to which they are attached. The patient says they grow very quickly. They are greatly increased in width, so much so, that instead of being enclosed, they overlapped by the lateral sides of the bed on which they lie, they overlap these. They are also increased in length. They show two marked curvatures:

1) Laterally.
2) From Above-Below.

The latter causing the nail to curve round
the distal extremity of the digital pulp.

These peculiarities are well marked in all
the nails, but especially so in the thumb
and middle fingers.

Taking first the fingers, it is noticed
that the 1st phalæus is greater than the middle
as is the case in the normal: but the
terminal phalæus is greatly enlarged, and
the digital pulp very much developed.

To show these changes, I have made the
following measurements in millimetres:

<table>
<thead>
<tr>
<th>Circumference of the Terminal Phalæus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>Normal</td>
</tr>
</tbody>
</table>

| Index Fing. | absent | 64. |
| Middle Fing. | 64. | 54. |
| Ring Fing.  | 62. | 46. |
| Little Fing. | 60. | 46. |
| Thumb       | 85. | 70. |

Transverse diameter of 2nd Left. Middle Phalæus:


Transverse diameter of Joint between 2nd & 3rd Phalææ:

R 23.  L 22.

Circumference of Joint between 2nd & 3rd Phalææ:

R 77.  L 76.
Side View of Fingers showing "Parrot's-beak" Nails. 

Side View of Left Middle Finger.
In examining the Nails more closely, the upper edge is seen to be decidedly higher than the free edge. In the Right thumb a difference of 5 mm., and the Right middle finger 6 mm. They are all striated longitudinally, but the thumbs only show some faint lateral striation. They are apparently of the ordinary thickness, and show no signs of longitudinal splitting. The Lunules of all the Nails are not markedly developed.

The Nails are normal in colour, but the skin on the back of the fingers round the nail is of a dusty hue.

<table>
<thead>
<tr>
<th>Length</th>
<th>Index</th>
<th>Right</th>
<th>Left</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>of Nails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>2.3</td>
<td>2.3</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Ring</td>
<td>2.1</td>
<td>2.1</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Little</td>
<td>2.1</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Thumb</td>
<td>2.5</td>
<td>2.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Width</th>
<th>Index</th>
<th>Right</th>
<th>Left</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>of Nails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>2.7</td>
<td>2.8</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Ring</td>
<td>2.5</td>
<td>2.5</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Little</td>
<td>1.8</td>
<td>1.7</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Thumb</td>
<td>3.0</td>
<td>3.2</td>
<td>1.7</td>
</tr>
</tbody>
</table>
The Hands of Case I (Osteo-arthropathy) compared with normal.
By these measurements, it is clearly seen, that in comparison with the normal, the nails are increased, both as regards length, and width.

On the patient bringing the thumb to the Radial side of the Index finger, it extends a little beyond the joint between the 1st and 2nd phalanges of that finger, whereas in the normal, it does not extend to that joint. The length of the fingers does not seem to be increased.

In examining the hand proper, it is seen, that the thenar and hypothenar eminences are somewhat wasted and flabby. There apparently is some enlargement in the region of the heads of the Metacarpal bones.

<table>
<thead>
<tr>
<th></th>
<th>Width of hand from head of 5th to head of 2nd Metacarpal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R</strong></td>
<td>82</td>
</tr>
<tr>
<td><strong>L</strong></td>
<td>80</td>
</tr>
<tr>
<td><strong>Normal</strong></td>
<td>83</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Anterior-Posterior Diameter of heads of 1st Metacarpal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>L</strong></td>
<td>31</td>
</tr>
<tr>
<td><strong>Normal</strong></td>
<td>21</td>
</tr>
</tbody>
</table>

Hence, from these measurements the increase seems more in thickness, than in breadth. The Metacarpal region of the hand does not seem to take part in any of the enlargement, though the patient had rather a broad hand.
Showing the condition of the hands and forearms.
Diameter between the middle of 5th + middle of Metacarpal
The length of the Metacarpals are shown to agree fairly closely with the normal:
Distance between the articular crease at the back of the wrist and distal end of 3rd Metacarpal:
Distance between the anterior lower crease of the wrist, and the crease at the base of middle finger:

On examining the bones around the wrist, there is apparently a great thickening, both in the Antero Posterior and Transverse directions of the lower ends of the Radius and Ulna.
This swelling commences about 10 centimetres above the wrist joint, increasing in size to the Styloid Processes.
The following measurements have been taken to show these enlargements.
The circumference of the Forearm at:
Just above the Styloids. 182. 182. 148.
Upper 1/3 of Forearm. 225. 220. 250.
Left Hand of Case I (Osteo-arthropathy – 5 ft 5 in) compared with the normal hand of a man 6 feet in height.
The diameters of the wrist:

<table>
<thead>
<tr>
<th></th>
<th>Right</th>
<th>Left</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antero-Posterior</td>
<td>5.0</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Transverse</td>
<td>7.2</td>
<td>7.2</td>
<td>5.7</td>
</tr>
</tbody>
</table>

By these measurements, it is seen that the circumference over the swelling is even greater than the circumference of the mid-forearm. The following figures will even show this more clearly, by comparing the measurements at the swelling, with those at a higher level.

Antero-Posterior Diameters at various parts of the forearm:

<table>
<thead>
<tr>
<th>Radial Side</th>
<th>Middle</th>
<th>Ulnar Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-forearm</td>
<td>25.</td>
<td>37.</td>
</tr>
<tr>
<td>Just above the swelling</td>
<td>24.</td>
<td>35.</td>
</tr>
<tr>
<td>At upper part of swelling</td>
<td>33.</td>
<td>45.</td>
</tr>
<tr>
<td>At the Styloid Processus</td>
<td>47.</td>
<td>50.</td>
</tr>
</tbody>
</table>

At the elbow, there appears to be some slight thickening of the bones, but not to a great extent. In fact, it is rather difficult to make out if there is any thickening, or not, from general inspection.
Transverse Diameter between the Condyles:
R. 78. L. 78.

Circumference over Olecranon with arm extended
380.

Antero-Posterior Diameter at the Olecranon:
60.
The same Diameter just above the Olecranon:
51.

Width of the Olecranon:
R 32. L. 34.

As regards the bones and parts around the shoulder joints, - they are not apparently much affected.

The outer ends of the Acromial Processes, both of the Clavicles & Scapulae may be slightly thickened, - but not to any degree.

The joints of the Upper Extremity show some conditions that must be noted.

In the terminal phalanges there is slight hyper-extension, - most marked in the Right Ring finger, and the Left Index finger.

Active flexion of the fingers is greatly diminished.
The patient is not able to close his hand, and
hence, he is unable to properly hold a knife and fork, or button his clothes.

The little finger when closed to its greatest extent, is 7 mm. from the hypothenar eminence, the others being about 19 mm. from the palm — and one can easily put their fingers between the 1st and 2nd fingers and palm.

(The left middle finger has a stiff joint, and naturally impedes the movement of the hand.)

The restricted movement seems to be due to two causes: 1) pain (articular) and 2) the tightness on the dorsal surface of the skin.

In the wrist, we note diminution of movement especially marked in extension.

To keep the hands in a state of flexion, or extension, apparently hurts the patient.

The movements of Supination + Pronation are painful, + slightly impeded, especially noticeable in the right arm.

The elbow is also restricted in movement. It is constantly in a state of slight flexion, and cannot be fully extended. When the patient tries to do so, he experiences pain. In the elbow also, there appears to be some slight effusion into the joint.
Showing the conditions of the Hands, Wrist, Feet, and Legs.
The shoulders are stiff, and painful on movement.
There are no cracklings on passive movements
of the shoulders, elbows or wrists.

""

In the lower limbs, there are conditions quite
analogous to those in the upper extremities,
though not so marked as regards the toes.
The toes are enlarged, especially their termi-
nal phalanges, with enormous nails,
the z. toes being the most distinctly marked.
The nails show the same curvatures as in
the upper extremity, viz: 1) front above, below;
2) transverse, and are striated in the
longitudinal direction.

The following are measurements of the Great toe.

<table>
<thead>
<tr>
<th></th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Circumference of end phalanx</td>
<td>10.4</td>
<td>10.0</td>
</tr>
<tr>
<td>Circumference at base of 2nd phalanx</td>
<td>9.5</td>
<td>9.1</td>
</tr>
<tr>
<td>Thickness</td>
<td>2.7</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Measurements of the Nail of the Great toe.

<table>
<thead>
<tr>
<th></th>
<th>Right</th>
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</tr>
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<tbody>
<tr>
<td>Length</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Width</td>
<td>3.1</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Showing the condition of the hands, legs, and feet.
The foot is markedly broadened in the region of the heads of Metatarsal Bones:

Right. Left.
Circumference. 220. 220.
Transverse Diameter. 9.7. 9.5.

The foot proper, the Metatarsal region, seems the least affected, though there is on the back of the foot some oedema which is increased by heat, as a fire, or hot bath.

In the region of the ankle, there is marked increase of size at the lower ends of the leg bones, and especially in the Tibula, the External Malleoli putting out more prominently than the Internal.

The following are measurements made in the region of the Malleoli:

Right. Left.
Circumference. 295. 310.
Transverse Diameter. 83. 80.

The swelling at the ankle is like that in the wrist, localized to the lower ends of the bones.
The Knee can be compared to the Elbow, but the increase of size in the former is distinctly greater than in the latter. All the bones apparently take part in this enlargement, even the Patella.

**Measurements of knee and leg.**

<table>
<thead>
<tr>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circumference at largest part of knee</td>
<td>39.2</td>
</tr>
<tr>
<td>Circumference of Calf (15 cm above malleolus)</td>
<td>28.0</td>
</tr>
<tr>
<td>Width of the Patella</td>
<td>68.0</td>
</tr>
<tr>
<td>Width of Tibia at the Tuberosity</td>
<td>90.0</td>
</tr>
<tr>
<td>Width of Tibia in the middle</td>
<td>52.0</td>
</tr>
</tbody>
</table>

There is no appreciable alteration in the thigh or in the bones of the pelvis.

The movements of the toes are decidedly more free than was the case with the fingers.

All the movements of Extension, Flexion, Eversion, and Inversion of the foot are fairly good.

In the Knee as in the Elbow, there is a state of constant partial flexion with inability to fully extend. But in the knees there are decided signs of effusion into the joints, and the movements
are more impaired than in the elbow, for the patient complains of pain on any attempt at flexion or extension - as for example in going upstairs. There is a want of spring in the gait - the man walking with the whole body more or less stiff even the arms.

As to the bones of the head or face, nothing abnormal is to be made out from examination of the patient.

The nose is slightly enlarged at the end, and is of a bluish-red colour, with varicosities; but it is difficult to say more, as it had been broken, and is deflected to the Right.

There is no apparent enlargement of the lower jaw, or prominence of the lower row of teeth in front of the upper.

Measurements of the lower jaw:

From joint - round the angle to middle of chin - 114.3

Biangular Diameter - - - - - 105.

There is neither thickening of the alveolar border of the Superior Maxilla, nor sharpening of the Palatal Arch, - though on the Left side, the latter is higher than on the Right.
The neck is somewhat thick and short, the circumference being 34.5.

There is no enlargement or abnormality noticed about the ear. It is situated 100 mm in front of the occiput, and 95 mm behind the glabella.

---

Cranial Dimensions.

Antero-Posterior Diameter 187.
Mento-Occipital 208.
Mento-Bregmatic 227.
Mento-Vertical 249.
Occipito-Bregmatic 150.
Bi-parietal 150.
Bi-mastoid 123.
Bi-auricular 133.
Bi-malar 108.
Bi-temporal 113.
Bi-zygomatic 133.

Occipito-frontal Circumference 548.
Occipito-glabellar 542.

---

No thickening of the cranial bones could be made out.
General View of the patient, showing especially the Dorsal kyphosis, and also the condition of the extremities.
The Vertebal Column.

There is a marked Kyphosis in the Dorsal Region, the 14th Dorsal Vertebra being the most prominent. Associated with this, there's a Lateral curvature, comparatively slight, with its convexity to the Left in the Dorsal Region, the 3rd and 4th Dorsal Vertebrae being most to the left, and to the Right in the Lumbar Region.

There appears to be no movement in the whole of the Dorsal Vertebrae.

On tapping the Vertebrae patient complains of pain slightly in the region of the lower cervical, the Mid-Dorsal (6th and 7th), and in the upper Lumbar (1st and 2nd).

The patient says that his height is less than it used to be, though he does not know what his former height was, but he has noticed that previously, he was slightly taller than his wife, while now, he says, she is slightly taller than he is. This might be accounted for in two ways: 1) the Kypho-scoliosis of the Vertebal Column, 2) the inability to fully extend the knees, they being constantly in a state of slight flexion.
Alimentary System.

The Lips are not a very good colour,- having a tendency to palor. They are not in anyway enlarged.

The Teeth are fairly regular, though the lower incisors are rather crowded. Several of the back teeth are carious. In the Left Lower Jaw, the 1st Molar is removed. - In the Left Upper Jaw, the 2nd Bicuspid, 1 3 Molars are carious. In the Right Lower Jaw, the 2nd Bicuspid, 1st, 2nd Molars have been removed, - as is the case also with the 1st Molar of the Right Upper Jaw.

The Gums are rather soft, - but are of fairly good colour. The patient says that occasionally, he bleed's slightly from them.

The Tongue - slightly tremulous, flabby, is furred at the edges, - but clear in the middle, and is marked at the sides by the teeth.

The Ridge in the middle of tongue well marked. Its transverse muscles do not apparently act well, - for he is unable to put the tongue in the shape of a gutter. 3.

It is not enlarged in any of its dimensions.
The patient says that the mouth and throat are constantly dry, and this causes him to feel thirsty, though the latter condition is easily satisfied, and is not marked. The fauces do not show any abnormality.

Deglutition good.

The appetite has been very poor, but since being admitted to the Hospital it has improved.

Sensations during fasting. — At times, when the patient has gone without food, he feels faint and giddy, and as he describes it "wants to reel". He has no discomfort during eating.

About ½ - 1 hour after eating, he feels a weight in the stomach, and I have noticed on examining him at such a time, that the stomach is distended. — Along with this feeling of weight, he occasionally gets palpitation and often complains of acidity and heartburn. Very occasionally after food he vomits, but at no other time.

The bowels are generally very regular, but the patient remarks that the motion is seldom formed, but always of a loose character and rather light in colour.

On examining the abdomen, it is seen
as a whole, to be very prominent, but with no local bulging.
There is an absence of any hair on the linea alba, from the umbilicus to the pubic hair.
On Palpation of the Abdomen it is found to be somewhat rigid, and resistant - no abnormal feeling to be noticed beyond this resistance, no tenderness, or pain at any part.
The lower border of the liver is felt extending a finger's breadth below the Costal Margin.

On Percussion - tympanitic note all over.
The liver is rather difficult to mark out at its upper margin owing to the dullness at the base of the Right Lung.
Absolute dullness extends from 2 inches below the nipple (in the nipple line), to about 1 finger's breadth below the Costal Margin.

**Hemopoietic System.**
The Lymphatic Glands of the Axilla, Groins re appear to be normal.
The Spleen, apparently normal, is not palpable below the Costal margin.
The Thyroid was neither palpable, nor visible.
Microscopic Examination of the Blood

The number of Red Corpuscles, as estimated by Gower's Hemocytometer, was on an average after oft repeated examination, 4,500,000 per c.mm.

The quantity of Hemo-globin as estimated by Heischel's Hemometer, varied considerably during his stay in the Hospital, but averaged 50% as compared with the normal of 85%.

On puncturing the finger, the blood that issued appeared rather fluid and with no tendency to coagulate.

I am indebted to my brother Dr. A. C. Coles, for the following.

Dry films of blood, stained with Shirsh's Acid Hemo-stylin and Eosine, and also with Eosine and Methyl-Blue showed that:

1) The Red Blood Corpuscles were fairly equal in size, shape, and staining reaction, though a few were somewhat semi-shaped, as seen in ordinary slight Anemia.

2) The Leucocytes, or White Blood Corpuscles were apparently normal.

The proportion of the various types were:-
(a) Multi-nucleated, or neutrophile cells    62.25%.
(b) Uni-nucleated
   1) Large               10.75%.
   2) Small              24.2%.
(c) The Eosinophile Cells                 28%.

"No abnormal elements were detected."

Circulatory System.

The patient says that occasionally, over the precordial region, he has pain of a burning nature, but this is not generally present. After food he sometimes complains of palpitation, also on exertion, such as coming upstairs, and when he gets "a little turn," that is feels nearer. He never feels faint, except when he has been without food for any length of time.

Dyspnea - see - Respiratory Notes.

Inspection of Precordia.

No abnormal signs, such as prominence, or retraction, seen. The Apex beat though is somewhat diffused, and seen in an area about 2 in. square. The point of greatest impulse is apparently in the 6th space - in the nipple line.
Palpation.

No thrill felt at any part.
The greatest intensity of the Apex beat is situated in the 5th Space, immediately inside the nipple line.

Percussion.

The superficial dullness commences above at the 4th rib, and runs down in a slanting direction to the Apex beat—in the 5th Space.

To the Right, the dullness extends to the Left border of the Sternum.

The dullness obtained by deep percussion commences above at the upper border of the 3rd Rib, and extends to the Left, in the 4th Space, almost to the nipple line. To the Right side, the dullness extends a little beyond the middle line of the Sternum.

Auscultation.

At the Mitral area, the 1st Sound is slightly blurred; the 2nd Sound is pure, but not very loud—Quite regular in action.

At the Tricuspid area, both sounds are heard distinctly—No impurity with either. The same also may be said of the Aortic area.

At the Pulmonary area, the 2nd sound is slightly accentuated as compared with the Aortic. 1st Sound pure.
Arteries. No evidence of any atheroma in any of the vessels. In the Carotids there is very slight pulsation seen in the neck on both sides.

Veins. Slight varicosities in the lower limbs. In the upper eye-lid, the veins are somewhat dilated as they are also at the back of the Pharynx.

The Pulse is regular, in rhythm. and the frequency is 70 per minute. It is somewhat small, and rather high-tensioned. The strength, as measure by Compressibility, is good.

The following are Tracings taken by Duggeon's Sphygmograph, the first in September, and the second in October 1895.
Integumentary System.

The skin, generally, has a somewhat greasy feeling to the touch. The patient says he perspires very freely, and especially is this to be noticed in the hands which are clammy. At the back of the terminal phalanges, small beads of perspiration are seen, which, the patient remarks, are nearly always present, and he is constantly wiping them.

In the foot, the same condition is seen, but not to such an extent as in the hand. Emaciation is marked in the body, and upper arms, but very little noticed in the lower limbs. The face is somewhat thin.

In the face, and also on the body, are a few slight acne spots — and, in the former especially, the sebaceous follicles are seen to be enlarged, as also are their openings.

The patient says that he often gets a rash on the body, which comes out, but dies away again very quickly, the cause of which he has never known. It is not localized to any particular part
of the body, as it occurs in various places.
It itches very much, and on putting the
question to him, he says that it is not
unlike a nettle-rash.
Beyond this has had no skin diseases.
The skin of the hands is fine, and supple,
and over the fingers, is somewhat stretchy
and of a yellowish tint. Over the
terminal phalanges it is markedly stretchy
and is thin, and glossy.
The same condition is seen in the feet,
where the skin is stretched.
There is some slight oedema noticed
on pressure at the instep.
At the sole, and inner side of each
foot, there is some slight ichthyosis.
There apparently seems to be a want
of growth of hair in many parts of
the body.
On the face, beyond the
upper lip + chin, there is no hair,
i.e. at the side of the face.
Again the chest is quite devoid of
hair, nor is there any on the Linen
Alba from the Umbilicus to the Pubis.
There is very little hair on the forearms.
and what there is is very fine.
On the backs of the hands and fingers also, the hair is very slight.
The legs are not so marked as the arms, but still there is not an average amount.

**Urinary System.**

Occasionally the patient complains of pain in the lower part of the back, but never in the urethra, or bladder.
There is neither difficulty, no frequency in passing urine; in fact, the patient thinks he does not micturate so frequently as he formerly did.
Many examinations of the urine were made, for the quantity varies considerably.
On 12 different occasions, the average amount passed in 24 hours was 29 ounces, the lowest being 22, and the highest 43. On the day he passed 43, there was no trace of albumen, but on each of the other days there was a trace, though very slight.
The Urine was "high coloured," and turbid after standing, there was a copious pink flocculent precipitate: the fluid above became clear in consequence, and was of a deep amber colour.

Analysis of Urine:

- Specific Gravity: 10.26
- Reaction: Acid - well marked.
- Albumen: Present - just a trace.
- Sugar: None.

Microscopical:

- Renal Casts: Absent.
- Urates (amorphous): Abundant.
- Uric Acid: No crystals.
- Blood: None.
- Urine: Only a few pavement cells of normal appearance. No Renal cells observed.

Quantitative Estimation of Urea:

- Amount of Urine passed in 24 hours: 29.03.
- Amount of Urea (Per cent): 2.1%
- (Per fluid ounce): 12.6 grains.
- Total Quantity of Urea for 24 hours: 355 4/5 grains.
Reproductive System.

The patient was married at the age of 16, and is the father of 5 children, all of whom are alive and well. He thinks that the penis is smaller than it used to be, but there is no evidence of that. He has had no sexual desire for the last 18 months, i.e., since the illness began - February 1894.

Nervous System.

Sensory Functions - The patient has noticed numbness and tingling in the thighs, and calves of both legs. He complains of coldness of the feet and says he is subject to flushings of the body generally, which are followed by a feeling of coldness. Occasionally he notices a burning sensation in the knees and hands, but on the other hand at times, especially early in the morning he complains bitterly of the coldness of the latter.

Sensibility to Touch - Tactile sense is diminished slightly, in the lower extremities, and is somewhat delayed, when tested by touching him with a pin.
Sensation to Heat and Cold - Normal.

Muscular Sense - Normal.

Special Senses.

The Sight. The pupils react normally to light, and accommodation. Movements of eyeballs and eyelids seem normal.

Vision:

\[ R = \frac{6}{9} \text{ partly, } L = \frac{6}{9} \text{ partly.} \]

\[ \text{w.r.t. } +1 \text{ D sph } = \frac{6}{6} \text{ fairly.} \]

Reads 1 Jaeger with difficulty.

\[ \text{w.r.t. } +15 \text{ D sph reads 1J easily.} \]

Ophthalmoscopic Examination.

Media - clear. Optic Discs - healthy colour. Retinae and choroids show no pathological condition, except perhaps slight transience of the Optic Veins.

The field of vision as tested by McHarry's perimeter, 10 mm in good daylight, is approximately normal for the White.

For the Ophthalmoscopic Examination I am indebted to Dr. Lawson.

Hearing. The watch test shows the hearing to be diminished on both sides; but on Otoscopic examination, this is
found to be due to wax, which, on removal by syringing, brings the hearing to about normal.

Bone conduction — normal.

Senses of Taste and Smell — normal.

Motor Functions

Organic reflexes — normal

Skin reflexes —

Gluteal — not well marked

Costal — not easily obtained

Epigastric — well marked especially Left

Plantar — normal

Cremasteric — distinctly marked

Tendon reflexes —

Patellar — normal

Triceps + Wrist — not obtained

There is no antediluvian.

Coordination — Patient frequently complains of giddiness, or lightness in the head, feeling as if he were going to fall, more to the left than to the Right side. Objects about him often seem to be
turning round him - He even notices this when in bed, especially after a short sleep, and it is increased by stooping.

Vaso-motor Functions - The patient is subject to flushings - sometimes over the whole body - and he has also noticed marked sweating over the backs of the fingers, especially the terminal phalanges - The same condition though less marked is seen in the toes.

Mental Functions - Intelligence - good.
Memory - diminishes especially during the last 12 months - and the patient cannot give his past history very clearly. He does not sleep very well - often waking up startled - and is subject to bad dreams (probably due to some dilatation of the stomach).

Treatment and Progress.
The patient, on being admitted to the Hospital was put on "Ordinary Diet", which consisted of:- Breakfast (8.15 a.m.) Egg and Bacon
(or Sardines) alternate mornings, with bread and butter and tea.
Dinner (12.30 p.m.) Joint (or sometimes tripe) and vegetables - Milk Pudding.
Tea (4.30 p.m.) Bread + butter and tea.
Supper (8 p.m.) Bread + butter and milk or Beef-Tea.

Beyond this the patient was at first on "extra milk". Which meant 2 pints of milk per day.

Before rising in the morning every patient in the Hospital has - hot cocoa, made with milk.
This patient was not kept in bed, but advised - if he were able to get out a little every day.

As regards Medicines, these consisted of Cod-liver-oil given with an Acid Tonic mixture (containing Ar nitris dulcit + Gentian). after meals three times a day.
Twice a day in milk + water, he took three minims of Bresoite.
The chest at both bases was painted with equal parts of the Luminent + mixture of Lobine.

A week after admission the patient seemed
decidedly better. — the appetite was improved, the breath not so short, and he was able to get out a little twice a day. During the first week, he gained 6 lbs. in weight. The temperature had been subnormal since admission. About 3 days after the last report, or 10 days from the time that he was admitted, the temperature went up in the evening to 100·6°, and on examination of the chest, some coarse crepitations were found just outside the left nipple in the anterior axillary line. The temperature dropped again to normal in two days. — During this time, the patient did not feel any worse than usual, and seemed surprised at not being allowed to go out as before. No further change was noted till August 6th when he complained greatly of pain in the dorsal region of the back. Emplastosum Rubri was applied, very soon gave relief. During this time the Cough was getting less troublesome, and he was not disturbed at night by it. His knees, where there was some slight effusion, were painted with Pipium Iodi.
The temperature on two or three occasions had been above 98.4° (the normal) once reaching 99.8° but no alteration was noticed in the chest.

The average evening temperature for the first month was 98.6° and the morning 97.2°.

The patient was still gaining weight, and at the end of four weeks, had increased exactly a stone, being now 96.6 lbs.

No difference was to be noticed in the hands or feet.

I then tried painting the back of the hands and fingers with Pigment lodi.

His general condition was very much improved. The knees were very little troubled, and he walked fairly well, though his back at times gave him pain, especially when he was without a plaster.

At the end of August, or about 7 weeks from his entry, the temperature was up on three successive nights to 100°, 100.6°, 101°. Examining the chest a slight pleuritic rub was heard on the Right side, low down. The temperature dropped on the 4th day.
to normal, and remained so, or slightly subnormal, until his discharge.
At the end of two months' stay in the Hospital, I noticed that his hands were improved.
The skin was more healthy looking, but was still tightly stretched over the fingers.
The chief improvement was in the movement of the fingers.
The oesophagus was increased to double the dose (mvi), for the patient had taken the other perfectly well.
His weight at this time was 90.5 lbs. — an increase of only 4 lbs. in the second month as compared with 14 in the first.
The cough had decidedly improved, and the expectoration was less — seldom did he ever bump up any phlegm except the first thing in the morning.
The chest, on examination, was found to be drier, — especially the bases — and the patch just outside the left nipple where now only a few fine crepitations could be heard.
About the end of September, I noticed that the skin over the fingers was much more supple, — and more freely moveable.
The condition now seemed as if it were not only bone hypertrophy that caused thickening but the soft parts as well.

The fingers, from this time, were massaged once a day, and shortly after, passive and active motion were tried, with good results, so much so, that the movements of the fingers became decidedly greater.

The patient, to encourage him to use the hands, was given some light work to do, and before leaving the Hospital, he was able to clean the knives, whereas when he came in, he was not able even to hold a knife and fork.

His weight at the end of 3 months was lost 1 lb., a gain of 106.9 lbs since admission.

The fingers, wrists, and ankles appeared decidedly smaller, but according to the measurements taken, there was found to be no diminution in size. But the patient had been gaining weight, and so putting on flesh, most clearly seen in the upper arms, which are decidedly larger than when he was admitted to the Hospital.

The patient from the time
he entered the Hospital (July 11th), to the time
he left (October 30th), gained 1st-12½ lbs in weight.
His lung condition did not alter much.
Both faces, and the patch outside the Left
nipple were decidedly clearer and drier.
There were still distinct signs of an old
dry cavity in the Right apex.
The cough was much less troublesome, Seldom
did it disturb him at night. The expectoration
was diminished, and not so thick.
(On several occasions I examined the
Sputum for Tubercle Bacilli - but the
examination was always negative).

On his discharge the movements of the
fingers were decidedly improved, and on
manipulation of the fingers, the bony enlargeme-
ment seemed decidedly less.
The knees have lost all the effusion, & are smaller.

So that I think we can safely say, the
general condition of the patient improved
to a great extent, - as shown by the great
increase of weight, – and the enlargements
of the various bones were less in size, but
that the measurements, to show this, were
obscured by the fact, that the patient had
had gained so much flesh.

The anterior-posterior diameters of both wrists showed diminution to the extent of 5 or 6 m.m.

Since leaving the Hospital, the patient has continued as an out-patient, under Dr. Walters, who has kindly given me the following additional notes concerning his condition.

The patient continued to improve after leaving the Hospital, and about Christmas time, was looking out for work— but the firm by which he had been employed previous to his illness, was broken up, and he was unable to obtain any.

In January the cough was somewhat troublesome, especially the first thing in the morning, and continued so till about the end of March, when he was suddenly taken with somewhat profuse hemoptysis. and Dr. Walters recommended his removal to St. Thomas's Hospital, where he was admitted
under Dr. Acland. The haemoptysis continued more or less profusely for about 3 days, and for 10 days after, the sputum was coloured.

The patient lost flesh very quickly, owing possibly to the haemorrhage and low diet.
Case II.

Albert Payne, age 36 - Coal porter - married, living at 45 Ambley Road, Paddington, was admitted into the Paddington Infirmary on the 14th December 1892, complaining of severe pains in the left side, under the axilla. He had been able to work until 2 weeks before being admitted.

History

Hereditary - Father alive and well (1872)

(though at the present time he is paralysed and is an inmate of Paddington Infirmary)

Mother - died after confinement.

No history of chest trouble, or enlargement of the hands or feet in any of the family.

Wife - alive, and well

Children 3 - one girl aged 11, and two boys aged 9 and 4. All strong & healthy.

Between the two boys the patient's wife miscarried at about the 6th month.

Habits as to food and drink.

Patient has
always had good food, and in good quantity. He had never been a big drinker - on an average, having about 1/2 pints of beer a day. He seldom took spirits.

General Surroundings at Home.

Except being in rather a crowded neighbourhood, the general conditions of his home were good.

At Work. (as a coalporter).

He was out in all weathers, and there was a good deal of dust connected with his work.

Previous Illnesses or Accidents.

Patient has always been a strong man, and has never had any previous illness, with the exception of children's diseases, of which he had measles, and whooping cough.

Some years ago he was admitted into hospital, having had his left foot run over by a cart. The foot he says was broken.

About 3 weeks before the present illness began, he was taking a sack of coals from the back of his cart, when the horse suddenly started. He fell and the
sack came down on his left side.

He imagines that this was the starting point
of his illness
Present Illness.

After the accident of the sack falling on him, the patient was able
to work, but always had, more or less,
some pain in the left side.

About 2 weeks previous to being admitted
or 3 weeks after this fall, the pains
became decidedly worse, and were like
the stabs of a knife, catching his breath,
and causing him to have a slight-
cough without expectoration. During
this time, the patient says that he had
some slight shiverings.

He was obliged to give up work, and as
the pain seemed to get no better, and
his breathing became somewhat difficult,
he applied, and was admitted to the
Paddington Infirmary on the 14th December 1872.

The following is a short account of the
condition of the patient, when admitted,
and his progress up to the time that I
saw him in October 1895:—

The patient— a man with rather a drawn face, lying on his left side, and when moved evidently suffering from pain— which he localizes to the left side, under the axilla.

Examination of Chest:

Movement impaired at the left base.

Vocal Vibration normal on the right side, but diminished, or absent— at left base.

Percussion:

On the right side, good note all over back, and front.

On the left side, good note in front, but at the base, posteriorly, almost an absolutely dull note obtained as far up as the spine of the scapula. This dullness extends round into the axilla.

Auscultation:

On the right side, the breath sounds incline to be harsh, with indefinite rales, both back, and front.

On the left side, in front, harsh breathing, and behind, in the upper part above
the Spine of the Scapula, - the breathing is decidedly harsh, with a few coarse crepitations at the lower part, the breath sounds are absent, or very greatly diminished. The vocal Resonance on the Right side is normal, - but on the left, is very insensible at the base. The Heart's apex is that was situated about 2 inches outside the nipple line, in the 5th Space. - The Heart sounds quite pure.

The patient has a remittent temperature, varying between 100° - 103° being generally higher at night than morning. During the nights he perspired very freely.

Urine - Specific Gravity 1024 - No albumen or Sugar. Acid reaction.

A needle was put in at the back, but no fluid was obtained at this time. About a month after this (Jan. 17th) the examination of the chest showed much the same condition, except that the dullness at the left base was more absolute, and even above the Spine of the Scapula the note was impaired somewhat,
and in front, on the left side, Ebersee remains was obtained.

A needle was again put in below and internal to the angle of the left scapula, and pus was obtained.

15 ounces of thick pus was drawn off with an aspirator.

Three days after this the chest was opened at the point where the needle was inserted, and also laterally in the space between the 5th and 6th ribs.

A great quantity of thickish pus came away. Drainage tubes were inserted and for several days following this, pus discharged freely from the posterior opening, but very little came from the lateral.

About 3 weeks after the operation, the pus from the posterior opening was found to be burrowing down beneath the skin, extending almost to the site chest forming quite a swelling in the lumbar region. An incision was made over this swelling, and a drainage tube inserted.

At the same time, a piece of rib was
resected at the Posterior opening, and better drainiage given to the Cavity.

At this time it was noticed that the liver was enlarged, extending, apparently, from the 5th space, to about an inch above the Umbilical Transverse line.

On February 27th, an incision had to be made under the Left nipple, and a tube inserted, owing to pus having collected there.

In March the patient improved greatly, and the discharge ceased. (The urine at this time however was loaded with albumen.)

In May, the examination of the chest, gave the probable signs of thickened pleura on the Left side.

The expectoration, which had been rather frothy, with some purulent matter since the operation, now became thicker and somewhat gummatous.

The patient was now putting on a little flesh and weighed 9 stones.

He improved slightly till August, 1893, when he was sent to a Convalescent Home at Margate, where he stayed two months.
He came back from Marpaz and started work again, but soon had to give it up owing to pain in the left side.

He re-entered the Infirmary in November 1878.

The examination of the chest at this time still showed almost absolute dullness at the left base.

A needle was inserted but no fluid obtained.

Soon after his re-admission to the Infirmary he complained of pains in the knees, and on examining, they were found to be swollen.

In January 1894, he first complained of pain in the joints of the hands, and they were swollen, especially noticeable in the metacarpal-phalangeal joints.

The ankles also were noticed to be swollen.

In February the hands had improved, but the swelling, and pain in the knees and ankles were more marked, and in March there were signs of marked effusion in the right knee.

The effusion became less, and during the summer of 1894, the patient was comparatively free from these rheumatic pains.

In September however, they returned, especially in the ankles, and left wrist.
Both wrists were swollen, but the left
the more so.

Soon after this, (November 1894), the first
note was made of "clubbing." The fingers
and toes were markedly "clubbed" as is
seen in chronic Heart + Lung cases sometimes,
but they were an exaggerated condition.

The enlargement took part only on the
3rd phalanges.

After this, on several occasions the sputum
was streaked, and in September 1895, he
had a slight hemoptysis, bringing up
about 2 ounces of bright-coloured blood.

In October 1895, I saw the patient at
the Paddington Infmary, and made the following
additional notes:

The patient was a man, age 35,
5 ft 6 in, high + weighing 142 5 lbs, with
rather a thin and drawn face.

There was no enlargement of the jaws,
ears, or nose to be noticed.

His complaint then was — "Troublesome
cough especially at night, bringing up a good
deal of phlegm — and occasionally pain
in the Left side.

**Examination of Chest.**

The left side of the chest is somewhat contracted, and does not expand well, this being especially noticeable at the left base on telling the patient to take a deep breath.

Both apices are somewhat flattened above, and below the Clavicles.

The Right shoulder is higher than the Left.

There is also a slight scoliosis, with convexity to the Right—in the Dorsal region, and to the Left in the Lumbar.

**Palpation.**

No thrill felt at any part of the chest. Vocal vibration increased at both apices, above, and below the Clavicles. Normal at Right base, but diminishes at the Left.

**Percussion.**

Impaired note at both apices, the Right being slightly higher pitched than the Left. Both back, and front. Good note in front, on both sides, below the 2nd space (except the Cardiac area).
The Right base gives a good note, but
the Left - dullness, which extends round
under the Axilla.

Auscultation

Harsh breathing with expiration pro-
longed at the Left apex. - A few fine
crepitations heard both in front, and behind.
At the base, posteriorly, the breathing is harsh
somewhat - but very distant. In the
Left axillary region, some coarse crepitations
are distinctly heard.
At the Right apex, the breathing is harsh,
and expiration greatly prolonged; - and there
are distinct coarse crepitations heard;
while at the base, the breathing is harsh
but there are no accompaniments.

Vocal Resonance is increased at the
Right apex, - and diminished at the
Left base, - other places being normal.

Thus apparently there is some
thickened pleura on the Left side, - with
slight consolidation at both apexes.

The expectoration, somewhat thick, and
evidently purulent, was examined microscopically,
and a few Intercal Bacilli were found.
The cardiac condition was apparently normal, – the apex beat being in the 5th space, just inside the nipple line.

The urine was rather high colored, and thick. – Specific Gravity 1022.

Slight trace of albumen – No sugar.

What struck me though on examining this patient, was the marked clubbing of the terminal phalanges of the hands and feet. They were increased in all proportions, and were covered by enormous nails, which overlapped the lateral borders of the bed, in which they usually lie.

The nails grow very quickly, and are striated in the longitudinal direction, and the middle finger nails of both hands, also slightly in the transverse. Their curvature is increased both from above below, and from side to side.

Circumference of the terminal phalanges of:

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These measurements, that I took in October 1875, show that the terminal phalanges were markedly increased, and that the nails were much larger, both in length, and width, than the normal.

The increase took part in all the phalanges, and the fingers were certainly like "branicles," the digital pulp was greatly developed.

On examining the wrists, they certainly appeared increased in size, but the patient
said he had always had large wrists, and did not think they were larger now, than they had been.

The circumference over the styloid processes was:—185 mm., which is certainly large for men of his stature; for I found in taking 9 men of his height, and build, that the average was 160 mm., the largest being 172 mm.

The same condition shows itself in the toes as in the fingers,—though not to the same extent.

The terminal phalanges are enlarged, and the nails increased in size, and curvature. The tip toes showed these changes better than the smaller.

The ankles were apparently normal, though they had been enlarged with slight effusion.

The knees appeared a little enlarged, but though difficult to make out, there was slight effusion into both joints.

All the movements of the fingers and toes were quite free—He could close the hand quite easily, and without pain.
There was no history of any skin disease, Syphilis or Gonorrhoea.

His memory, he states, is not so good as it formerly was.

During nearly the whole of his illness he had and he now has, a tremendous appetite.

The treatment was primarily drainage of the Pleural Cavity.

Medicinally, he was taking at first Acid Tonics and Cod Liver Oil. The latter however the patient was not able to keep down, and the extract of Malt was substituted for it. For the excessive night sweats he was first given a pill containing Oxide of Zinc & Belladonna, but this failing, Quinine (Sulphate of) was tried with decided improvement.

In March of this year I again saw the patient (who was still an inmate of the Paddington Infirmary) and was struck by the decided improvement.
not only of his general condition, but of his pharynx.

Since December he had almost ceased expectorating, his cough was less, and the night sweats, which previously were quite excessive, troubled him no longer, even without taking the sulphate of quinine, which apparently had been the only thing to prevent them.

His general appearance was quite different. He had gained 1½ lbs in weight, and appeared much stronger.

The examination of the chest still showed dulness at the base of the left side, and the note at both apices was impaired.

On auscultating, the lungs were decidedly clearer and drier— for at the right apex, the coarse crepitations had disappeared, and only some very fine ones heard now with inspiration. The breathing was almost tubular just under the right clavicle, but there was no whispering pectoroquy.

The left side was about the same as before.
Over all the areas of the heart however the first sound was accentuated, but there were no murmurs.

I made the following measurements in March, about five months after those previously given were taken:--

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Diagram of a Normal finger.

Diagram of finger of Case II (October 1875)

Diagram of finger of Case II (March 1876)
These measurements, when compared with those taken in the previous October, show a decided diminution in the size of the terminal phalanges of all the fingers, and thumb. The Digital pulp, which formerly had been quite excessively developed, had now a normal, or almost flattened appearance.

The size of all the toes was also less, and they were not so bulbous as before.

The nails also showed a slight decrease both as regards their length, and width.

A most interesting condition however was to be seen connected with them; for the new nail, or proximal third was flat, and normal as compared with the other two thirds, (which was still markedly curved both from above below and side to side) and was separated from it by a distinct line of demarcation. (See diagram).

This I think distinctly shows, that in all probability, in a little time the nails will have an almost normal appearance.

When I made measurements of the wrist in October, I was undecided whether the wrists
were larger than their ordinary condition or not.

The patient had then remarked that he had always had large wrists, and did not think they were increased at all in size.

They certainly appeared large, and the lower ends of the Radius & Ulna felt thickened.

However, since those measurements were taken - and notwithstanding the fact that the patient has been putting on flesh - the circumference over the Styloid Processes has diminished from 185 m.m. to 175 m.m.

I have obtained a Skiapraph photo (3 minutes exposure) of this patient's hand, which apparently shows very little - if any, hypertrophy of the terminal phalanges - but slight thickening of the first.

Unfortunately, it was taken when the condition of the fingers had greatly improved.
General Description of Pulmonary Hypertrophic Osteo-arthropathy.
History.

This morbid state has only been quite recently separated from other conditions.

Bamberger, first in 1889, and again in 1891, described peculiar changes of the nature of an Osteitis - occurring at the periphery of certain long bones, - with marked clubbing of the fingers and toes, associated with Bronchectasis, and some cases of Congestive Heart disease. - In the latter however the changes in the long bones were not so evident.

He formed the idea that the absorption of a chemical poison, produced in the pleura, lung or bronchial tubes was the cause of these conditions, - and in order to prove this, made rectal & subcutaneous injections into rabbits, endeavouring to produce these lesions, but was not successful.

Almost at the same time Marie, in January 1890, described the characteristic lesions of this morbid state, and gave to it the name of "Osteoarthropathie Hypertrophique Pneumique".

He saw that it was necessary to distinguish
it from Acromegaly, which he (Marie) first described in 1886, - for he found that a case, which he had could not come under the head of the latter condition. He also noticed that several cases (e.g., those recorded by Friedrich Erb, Frantzel, Oswalt and Sarmy) described as Acromegaly, were in his opinion true cases of Pulmonary Hypertrophic Osteoarthropathy.

Marie found that in these cases, and also in others, that he was examining, certain conditions differing from those of Acromegaly, viz.: -

1) There was a previous history of Pleural, or Pulmonary Disease.

2) The Cervico-Dorsal Kyphosis of Acromegaly was not present, - and if present, was Dorso-Lumbar in position.

3) The hands & feet differed from those of Acromegaly in the distribution of their enlargement.

4) In Acromegaly, the nails are small in comparison with the enlarged fingers, whereas, in Osteoarthropathy, they were extremely larger - even in comparison
with the enlarged finger ends.

3) In Osteopathathy, certain bones—other than the hands and feet—of the extremities show changes, whereas in Aceromegaly this is not so.

These reasons led Marie to think that this was an altogether different condition from Aceromegaly, and that it was secondary, apparently to Pulmonary diseases.

His theories of the causation were—"A lesion of the respiratory apparatus permitting probably, under the influence of micro-organisms, of the production at this spot, of putrid or fermenting substances; secondly, the absorption and passage into the circulation of these substances produced in the respiratory apparatus; thirdly, the elective action of these substances on certain parts of the bones and of the articulations, determining the lesions of hypertrophic osteo-arthritis."

He compares his third theory with Gout, which owing to the uric acid in the blood,
attacks always, - or almost always, - with great precision, the same points in the osteo-fibrous system.

Although both acting separately, - Bamberger and Marie coincide very closely in their theory of the causation of these changes.

Immediately after Marie's description of Pulmonary Hypertrophic Osteoarthropathy had been published, - Spilhaus and Haushalter recorded a case, and in the same year Souza-Leite, and Shibarpe wrote on the subject, without however adding any new cases.

Redmond describes a case in Ireland of Aromegaly, - which, in my opinion, should be classed under Osteo-arthropathy.

In the following year - 1891, - Rangier published a case followed by Autopsy, this being the first performed -

therefore added 2 cases, - with Autopsy of one, and a Histological and Chemical Analyses of the Bones, - and Renner, + Freytag both report fresh cases.

In 1892 some most interesting cases were recorded by Dolland, - Schmidt, who also
gives a case by Smirnoff, both of which were probably due to Syphilis, with no history of lung or heart disease in either.

Gillet records two cases in children, and Möbius and Jackard one each, the latter being the first case recorded in America.

In the same year, a general review of the condition was given by Millard, in addition to the fresh case he had added.

In 1893, Murray records two cases in children, and Marfan three, one of which occurred after a phlegmonous without any history of cardiac or pulmonary disease.

Following these, there are 3 cases recorded by Thorburn, the first described in England.

Cristiyan gives another case as probably of syphilitic origin, and Marin (Italy) Stemberg (St. Petersburg) Field and Kerr each add a new case.

In 1894, Dr. Braine publishes an account of the urine in the case of osteo-artropathy, and Demons and Binard, together, record a new case, with an interesting method of treatment adopted, viz. subcutaneous
injections of tissue extract, made from the lump of healthy sheep. In this same year, Posnanski records a case, (Spitalul București 1894) the details of which, so far, I have not been able to obtain.

In 1896, Murray records a new case associated with Gout, which, though not well marked, was seen by Mr. Jonathan Hutchinson, who considered it to be a case of "Osteoarthropathy associated with Gout".

Springthorpe describes a case in Australia. Davis gives the principal points of a case occurring in a child, but so far the result of treatment has not been published. Finally this year, we have 3 cases reported by Thayer from America.
Hand of Lesebu's 1st case.
Symptoms.

The chief features of osteo-arthropathy are the malformations, which, when once seen, are very characteristic. They are generally symmetrical, and as a rule, occur at the distal ends of the bones.

Taking first the Hand, the fingers and wrist are noticed to be markedly deformed, whilst the carpo-metacarpal remains very little altered from the normal. The German authorities have described them as being very like paws.

The Fingers.

The fingers are very enlarged, but not uniformly so, for their form is not preserved as in Arthromathy,—the terminal phalanges being the seat of greatest enlargement. This segment is the largest of the three, and is bulbous. The fingers have been likened by Marie to "drumsticks." The increase in size of the terminal phalanges takes place both on the palmar and dorsal surfaces. LeFebvre in the description of his case says, "the hypertrophy of the
Showing the condition of the Snipers' rails.
digital pulp is in some cases rendered less evident by the hyper-extension of the last phalanges, which is noted in some patients. One can make it more clear, by asking the patient to slightly flex the fingers. In our case there was almost subluxation backwards of the terminal phalanges on the second finger.

In examining the fingers the very large size of the nails is noticed, even in comparison with the tremendous phalanges on which they are placed. In fact they strike one as being too large for the fingers, and, especially is this to be observed in the case of the thumb. They are greatly increased in width, and overlap the lateral borders of the bed in which they lie, instead of being overlapped by them. They grow very quickly, and are somewhat fragile, and usually thin, and are striated in the longitudinal direction, (sometimes tending to split in this direction), and more rarely in the transverse. They are curved distinctly in two directions, (a) horizontally
Thumb of Friedrich Erbs 1st Case

Middle Finger of Gouraud-Marie's Case
which is the more marked, and 
(3) vertically, - and this latter causes their 
free edge to cover more or less the digital extremity.

This vertical curvature also makes the 
proximal end of the nail on a very much 
higher plane than the free edge, as was 
noticed in Case I which I have described 
where there was a difference of 6 mm. 
in the nail of the middle finger and 5 mm. 
in that of the thumb.

Some observers have mentioned that the 
bundle extends half way up the nail [Lefebvre 
and Demouy and Biniard], whilst Christian noted 
it's absence.

Marie [2] to describe the appearance of these 
nails, has used the term "watch-glass," as 
seen from the dorsal surface, - whereas 
seen in profile with the terminal phalanges, 
it resembles a "parrot's beak."

The following measurements show the increase 
in size of the nails:

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Carpo-metacarpal region.

In the carpo-metacarpal region very little alteration is noticed from the normal, except a slight hypertrophy of the heads of the metacarpal bones.

The Wrist.

The wrist is usually the seat of marked alterations. The lower ends of the Radius and Ulna are greatly increased, both in the antero-posterior, and transverse diameters. The styloid processes take part in the enlargement, which usually starts gradually, about 8-16 cent above the wrist-joint.

"The enlargement strikes one at a glance, for the lower ends of the two bones of the forearm are seen to bulge abruptly out, forming an enormous projection above the hand. The swelling is
Antero-posterior as well as Transverse, and
the circumference of the lower part is
greater than that of the mid-forearm, or
sometimes even of the part just below
the elbow.” (Marie).

In Case I
that I have described the circumference
over the Styloid Processes was some 2 cent
greater than that over the mid-forearm
but was not so large by about the
same measurement as the circumference
of the upper third.

This modification of the forearm is one
of the distinguishing points between osteo-
arthritis and Arthromepaly, - but at the
same time, it must be said that in
many cases recorded as belonging to
the former, the forearm has not been
enlarged, - as, for instance, the cases
described in children, by Gillet, Morjard,
Mousseau, and in adults, one case by
Marie himself, and also Lefèvre’s second
case. - In Case II that I have des-
cribed, I had some doubt at first whether
or not the forearm was increased, - but
as the fingers decreased, the wrist also
became less, although the patient was putting on flesh, so that I think the wrists were enlarged in the first place.

The Elbow.

Although not nearly so constant as changes in the wrists, the elbows sometimes are enlarged, and usually bilateral, but in the case described by Orillard, the Right alone was affected. The three bones forming the elbow-joint take part in this enlargement, but the Radius the least of the three.

The Shoulder.

The shoulder is very rarely affected, but in Conrad-Marie's case it was the seat of Chronic Arthritis. The Clavicle is sometimes especially in its outer third, and on its anterior border.

The Scapulae, when altered at all have been thickened along their spines, especially at their acromial ends.

In Case I described by me, the Clavicles
and Scapulae were perhaps a little thickened at their acromial ends,—but certainly not to any marked degree. In Case II no such thickening could be made out.

In the Lower Limb, changes are found quite analogous to those in the upper, but in the majority of cases described, the malformations of the hands are more marked than those of the feet.

The Toes.

The toes are enlarged,—but especially the terminal phalanges, which are bulbous, and increased in their three diameters,—and show very markedly the drumstick condition described by Marie. The Nails too are enlarged, and greatly curved, and give the "watchglass" (viewed from the dorsum), and "parrot's beak" (viewed in profile) appearances. The big toes, in the majority of cases, show these changes, but in Case I, I noted that the 2nd toes were more marked.
even than the big toes, - this being also seen in the case described by Demongeot-Rinaud.

The Tarso-metatarsal region.

The tarso-metatarsal region, like the carpo-metacarpal region of the hand, is the least affected, - and, in fact, is very little altered from the normal. The heads of the metatarsal bones show some thickening, and broaden the appearance of the foot. This situation is sometimes the seat of chronic sepsis, as seen in the cases of Marcetzel - Summerby - Elliot-LeFevre - and Packard.

The Ankle.

The changes seen in the ankle correspond closely with those of the wrist. Some of the observers have compared it to an elephant's foot. Both the Fibula and Tibia take part in this enlargement, - the dimensions of which, are increased both in the antero-posterior and Transverse directions, - the latter being the more marked, and sometimes the
circumferential measurement in this region is even greater than that of the middle part of the leg.

The Knee.

As in the elbow, the knee takes in the enlargement, but more so in the latter than the former. Both the upper end of the Tibia, and the lower end of the Femur are increased in size, and the Patella is sometimes very much larger than normal, being increased in the two directions, from above-below, and transversely. In Case I that I described, there was slight enlargement transversely of the Patella, but not from above-below.

The knees jut out anteriortly, and thus increase the Antero-posterior diameter, but they are also increased in the transverse direction. In many of the joints, but especially the Knee, there is often effusion.

The Hip apparently is not affected.
The Bones of the Trunk.

In examining the cases described, the enlargement of the bones of the trunk is not by any means constant.

The Sternum has been mentioned as being large, and massive in some cases, e.g. the brothers Hapner (Friedreich-Erb). The Ribs sometimes are increased in size, especially at their Sternal ends, where, in the case recorded by Stiernman & Hausshalter, they measured nearly 3 cent. in width. The Iniac bones, especially their crests, in some cases have been recorded as being painful and thickened (Friedreich-Erb, Waldo, Saunders. Stiernman & Hausshalter).

In the Spine, well-marked changes, although not constant, have been recorded in several cases. These conditions are supposed to occur late in the disease, but in Case I that I describe it was one of the first changes.

There may be conditions seen in the Vertebral Column:

1) a Kyphosis
2) a Scoliosis.
Sometimes these are combined to form a kypho-scoliosis.

The kyphosis, according to Marie (2), is situated in the Dorsal-Lumbar region, and he has taken this as a distinguishing point between Ostearthropathy and Acromegaly, in the latter of which, the Kyphosis is Cervical or Cervico-Dorsal. In my case the kyphosis was distinctly dorsal, the highest and most prominent point being the 4th Dorsal vertebra. Other cases have also described it as being Dorsal, e.g. Orillard, where the 7th Dorsal vertebra was the most—Demons-Roumier, Rangier, Packard, (in which case, a weighted string dropped from the 7th Dorsal vertebra, the most prominent, fell some 4 inches clear of the Sacrum)—and one case by Bamberger, whilst in the Coutard-Marie case there is a double curvature—Cervico-Dorsal, and Dorso-Lumbar.

Some observers have mentioned marked enlargement, and thickening of the vertebral bones. These modifications in the spine somewhat explain the diminished stature.
recorded in a few of these cases, as noted in "Case I" and those described by Friedrich-Sch" (28)
Häupner where there was a diminution of 4.5 mm.
Gouraud-Marie, a diminution of 6 centim.
Orillard, 8 centim., Ranzier, 3 centim.
and Demeng and Buianu, 3 centim.

The Bones of the Head and Face.

Nothing abnormal is noted about the bones of the head and face as a rule.
Friedrich-Sch" (28) report in the elder Häupner a hypertrophy of the Malar bones, Palatal bones, and also of the Alveolar border of the Superior maxillae. Gouraud-Marie (28)
in their case state some thickening of this Alveolar border, (11 mm. instead of the normal 8 or 9 mm.), and add that it is usually most marked at the extremity, behind the last molar tooth.
Thomburn in his first case records prominent Malar bones, Chréien, Emirnoff
+ Stamba prominent Superior Maxillae.
Haldo records both.
Functional Signs.

The movements of the various joints are restricted, probably due to the hypertrophy of the Epiphyses of the bones, and also perhaps to the hypertrophy of the peri-articular tissues.

"The patients are clumsy with their hands - and if you ask them to grasp your hand, - the commencement of the effort seems quite energetic, but the pressure gets less and less as the hand closes.

One feels, that the effort persists, but that an obstacle (the osseous malformations of the articulation) seems to make a limit to the application of the digital pulp to the palm of the hand." (Referece).

The elbows and knees are often seen to be constantly in a state of partial flexion, - and complete extension is impossible, - and even the attempt to fully extend causes pain.

This partial flexion of the knees is probably a second cause of the diminution in height noticed in some of these patients. In the case
of Millard, the left elbow could be fully extended, but the right at its best could only make an angle of 150°, and in the mornings much less than this. Sometimes the shoulder and hip movements are impaired.

Pain is a very variable symptom — in some cases being entirely absent, while in others a most distressing one... It is variable, both as regards its localization, and intensity. Millard in his case, describes the pain as very severe, and running in the course of the 6½, 7½, and 8½ Right Intercostal nerves.

Some have noted pain in the lumbar column — making walking difficult, and hyperaesthesia of the body. (Elliot Sollier, Spillmann, and Hamshalter).

In Case I that I described, there was often a dull aching pain down the back, which was always relieved by a plaster. It was situated generally in the Dorsal region. In Case II, there was pain in several of the joints before any of the enlargements took place.
Sollier says that in his case there were lightening pains in the four limbs, occurring some eight or ten times a day.

In the region of the joints, too, pains have been noted, varying in character, and intensity, and sometimes only being present on manipulation of the joint.

The skin shows changes, greatly varying in many of the instances.

Gouraud-Marie records a greasy skin, which was a prominent feature in my first case.

Enlargement of the sebaceous glands, and their openings, have been noted in many cases (Lefebvre, Gouraud-Marie, Friedrich-Seb and Case I).

Various forms of eruptions have been described, e.g. Urticaria was reported in Drillard's case, occurring several times a day in various parts of the body, apparently being brought on by exposure to the air, even for example, when the chest was unventilated. Urticaria was also present according to the patient's account, in the first case described by me, but I
never saw any rash during the time that he was in the Hospital.

Eczema, — Ichthyosis, (Demons + Rinard —
Soldier — Strumphothi — Lefebre + Slightly in Case 1),

and yellow purpuricary patches. (Daudby + Lefebre) have been described, and Elliott
in his case, mentioned the existence of
some flattened nodules, measuring 10 of an
inch in diameter of unknown nature.

Moizard in his case of M. Hoffmann, a
little girl aged 5, — records a peculiar
turgescence of the terminal phalanges,
which markedly increased when the tem-
perature was raised, and diminished as
the temperature fell.

Excessive perspiration has been noticed
in many cases, especially on the backs
of the terminal phalanges, — this being
well-marked in Case 1 that I have
described, — where small beads of
perspiration were almost constantly seen.

Sometimes the nose is enlarged,
especially at its end, and is of a
bluish red colour, with varicocities.

Some observers have described en-
largepment of the ears, eyelids, & lips.  

Friedreich-Serb⁴ described in both the brothers Hapner, — retro-sternal dullness,—
the cause of the elder being due to the
remaining of the Thymus, — & fat around it.
Spillmann + Hansehalter⁵ noted the same
dullness,— which was probably due to thoric
enlargement,— and Ewald mentioned
dullness in the same region, triangular
in shape, with the apex turned downwards
and found, at the Autopsy, to be due to
malignant — mediastinal glands.

Orillard in his case noticed that
the size of the tumours varied several
times during the day, & remarked that
the Veins motors by might be the cause of it.
In my first case I mentioned that
the hands, when cold, appeared smaller
than when hot, — though on this point
I was never satisfied, — for though they
certainly appeared smaller, — and the
patient remarked that they were less
the measurements never showed
any difference.

The Analysis of Urine
have not given great results.

Friedreich-Elb\(^{(3)}\) and Samuels\(^{(2)}\) noted alkalinity with abundant phosphates, while Demou\(^{(24)}\) and Binaud and Christien\(^{(20)}\), in their cases, found the urine to be neutral.

Lefrain investigated the urine of a patient in whom the lesions started in infancy, and were still present at the time of the examination—age 25.

He found the quantity normal or perhaps slightly increased. He also notes that there was a double quantity of lime salts, with a normal quantity of magnesium salts, and that giving lactic acid internally increased the disproportion.

In Case 1 that I describe the quantity voided daily was certainly less than normal, an average of 29 ounces per day. The specific gravity was a little high, and it was markedly acid—containing only a trace of albumen.

Various conditions of the Thyroid have been noted. In some cases an absence to sight and touch (Friedreich-Elb\(^{(3)}\), Glenbo, Redmond\(^{(1)}\), Packard and Case I)
whilst others again have remarked some atrophy (Stellman & Hausalet, Franzel, Gerhardt and Lamy), and Walds in his case records an increase of the left lobe, with inability to feel the right.

Some authors describe great hunger and others great thirst without Diabetes.

In many cases there are marked irregularity, and bad condition of the teeth.

Many of the patients, having osteoarthropathy, entirely lose their sexual desire (Gommar, Marie, Parny, Wolf, Packard, Stellman & Hausalet, Lefebvre, Ranger and Renier, and Case I).

As regards sensations, these vary greatly.

Many have noted numbness, tingling, anesthesia, hyperesthesia, &c. but Marie considers these as superadded.

In some cases there is marked stiffness, even when lying down (Lefebvre & Case I).

The Organs of Sense are normal except perhaps some very slight diminution of actual vision.

Gillet, in his case of Victel, records that the patient was first affected.
with the deformity at the age of 6, following Bronchitis. Since this time his growth has been stationary, and instead of appearing 13 (his present age) he appears as a boy of 6, but his intelligence is quite that of a boy of 13.

Spurthorpe also remarks on the non-development of his case, for the penis was like that of a boy.

The general symptoms follow naturally the causal affection, and vary greatly.

"Osteo-arthropathy is not a disease - but a morbid state, following in the course of a former disease and the general symptoms are all dependent on this primary affection.

Whether cachexia follows most frequently the malformation of the articulations, or whether osteo-arthropathy adds its cachectic effects to those of the causal affection, or whether by selection cachexia only appears in those subjects tending towards a fatal issue, seems somewhat doubtful" (Lefebvre).
Diagnosis.

When the malformations of pulmonary hypertrophic osteoarthropathy have been once seen - they are so typical, and characteristic they could hardly be mistaken. Many cases however were described under the name of Acromegaly, before Marie showed the distinction between the two.

Pulmonary Hypertrophic Osteoarthropathy and Acromegaly.

In the first place, Acromegaly is considered as a primary disease, whereas Osteoarthropathy is a secondary condition, possibly, as in the majority of cases, secondary to Pleural, or Pulmonary conditions.

The seats of the enlargements are different in the two conditions, for in Acromegaly one is immediately struck by the shape and peculiar form of the face. The lower jaw is markedly enlarged, and elenaped, producing prognathism, marked prominence of the chin, so that the lower row of teeth are on a plane in front of those of the upper, and
hence, one notices, in these patients, troubles of mastication, deglutition and speech. This condition gives to the face of an Acromegaly patient, the appearance of an elongated oval. Still further the nose is seen to be markedly enlarged in all proportions, and the lips, especially the lower, are thickened. The tongue is enormous, and the larynx is increased in size. The sutures of the cranium are also very prominent.

All these conditions in Osteo-arthritis are absent, and the only important condition of hypertrophy of bones of the face, or head, that has been noted is the Alveolar border of the Superior Maxilla, especially behind the last molar — and this though very rare in Osteo-arthritis, has never been recorded in Acromegaly.

Passing to the spine, Marie and others have laid great stress as a differential point on the situation of the Kyphosis. This Kyphosis may be altogether absent in Osteo-arthritis, as apparently it is a late condition, but in the first case that I describe — it was the first malformation
noticed, - it might however have been due here to Caries now quiescent.
When present in Osteo-arthropathy it is Dorsal-Lumbar, according to Marie, - in
Aromepa it is Cervico-Dorsal, it is said to be a much shorter curve than in the
former. In the cases of osteo-arthropa-
yth by: Bemont - Bucard, - Bamberger, - Ranger,
Gillard, - Gouraud - Marie (in which there was
a double curvature) Packard, and "Case I" the
Kyphosis was decidedly Dorsal, - in only
one or two more cases is it Dorsal-Lumbar,
for in many cases it is not present at all,
so that I consider it's situation as an
uncertain point of diagnosis.

Passing to the Hands, we find that
in Aromepa they are enormous in all
proportions, - but preserve their shape.
The fingers are very large, and equally so
for their shape is also preserved.
They have been described as "sausage-shaped",
- being dumpy, with their base as large
as their extremity.
The nails also differ greatly from those
that I have described in Osteo-arthropathy,
They appear, in Acromegaly, decidedly small for their fingers, and are thicker and less flexible than normal.

The feet too, as the hands, are enormous but their form is preserved. The toes also are enlarged, but uniformly so.

The other parts—of the forearm, legs, shoulders, knees, and elbows, appear to be perfectly normal.

The wrists and ankles may occasionally be slightly enlarged, but nothing in proportion with the hands.

From this short description of the hands and feet in Acromegaly, one can easily see the great difference in the malformation of that disease, and those of Osteoarthropathy.

In Acromegaly, eye troubles—ever grip on to complete blindness, have been noticed, but there have been no eye conditions reported in Osteoarthropathy.

Acromegaly is most common in the female, but has been seen in the male sex, whilst Osteoarthropathy most common in the male sex has also been seen in the female.
At the post-mortem in the Acromegaly cases, the pituitary has been found enlarged, but in the few cases of osteo-arthropathy in which a post-mortem has been made no such enlargement was seen.

The following is a table arranged from Marie's paper by Souza-Leite.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Acromegaly</th>
<th>Osteo-arthropathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>Hands &quot;spade-like&quot; enormously Indeed.</td>
<td>Enormous + deformed; not enlarged</td>
</tr>
<tr>
<td>Extremity</td>
<td>Extremely thickened, though not lengthened.</td>
<td>in carpo-metacarpal region; but in</td>
</tr>
<tr>
<td></td>
<td>fingers &quot;sausage-shaped&quot;. Throat + hypopharynx eminences enlarged.</td>
<td>fingers especially the last phalanges.</td>
</tr>
<tr>
<td></td>
<td>Nails small, wrists in proportion; as a rule the hypertrophy ceases</td>
<td>Nails enlarged + curved; lower ends of radius + ulna forming an enormous projection above the wrist.</td>
</tr>
<tr>
<td></td>
<td>at the wrist</td>
<td></td>
</tr>
<tr>
<td>Feet</td>
<td>Similarly enlarged, thickened, flattened, hypertrophy ceasing at ankle.</td>
<td>Like the hands; last phalanges enlarged. The ankle thickened + deformed. The lower metatarsus least hypertrophied.</td>
</tr>
<tr>
<td>Head+Face</td>
<td>Face enlarged, elongated oval, lips thick; tongue hypertrophied; nose large and flat; orbital ridges projecting; prognathism; lower jaw; ears enlarged; skin pigmented.</td>
<td>Not enlarged or oval; lower jaw not prognathous. Lips, tongue, nose + larynx not enlarged.</td>
</tr>
<tr>
<td>Spine</td>
<td>Marked cervico-dorsal curvature, with slight lumbar lordosis.</td>
<td>Curvature lower dorsal + lumbar.</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Acromegaly</td>
<td>Pulmonary Hypertrophic Osteo-arthritis</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>General</td>
<td>Hypertrophy of all the tissues en masse.</td>
<td>Hypertrophy of long bones especially at articular ends.</td>
</tr>
<tr>
<td></td>
<td>Alteration in voice; headache; pain, thirst; bullae, changes in vision.</td>
<td>Absent.</td>
</tr>
<tr>
<td>Post-mortal</td>
<td>Skull sinuses dilated; fossae at the base especially pituitary enlarged; pituitary body hypertrophied also. Ganglia of sympathetic; thyroids persistent; thyroid altered, also organs of speech and sexuality; heart + blood vessels hypertrophied.</td>
<td>Respiratory affections - for example empyema in two, neoplasia of lung in two; and bronchitic affection in three; heart affections also.</td>
</tr>
</tbody>
</table>

**Osteo-arthritis and Osteitis Deformans of Paget.**

In Osteitis Deformans there is increased thickening of the bones of the skull, trunk and limbs, and marked curvature of the long bones. The femur and tibia are especially curved inward, and so the feet and knees are apart, and sometimes the legs are crossed in the shape of the letter “X.”

The trunk and neck are fixed in a state of very marked anterior flexion, and from this condition there naturally follows a
hindrance to the respiratory effort. — The chest is flattened.

Marie has recorded in this disease — very acute pains, — likening them to the lightning pains. The upper limbs, which are not diminished, appear too long for the body, and hang down in front of the thigh, — sometimes reaching as low as the middle of the legs, and giving to the patient a monkey-like attitude.

It will thus be seen that in Osteitis Deformans of Periostitis, the diaphyses of the bones are affected whereas in Osteo-arthropathy it is the epiphyses.

In Osteo-arthropathy the malformations are as a rule symmetrical, — but in Osteitis Deformans, — it seems that the lesion establishes itself at first on one segment of the limb, and remains stationary for a time, and afterwards jumps slowly to symmetrical bones, one after another.

In Osteitis Deformans the bones tend to develop cancerous growths, — and the disease rarely occurs before the age of 50, — is especially seen in arthritic subjects — and appears to occur about equally in both sexes.
whereas Osteoarthropathy is seen mostly at middle age, but may occur at any age, for several cases have now been recorded in children. It is more prevalent in males.

Osteoarthropathy and Leontiasis Ossea of Virchow.

In the disease described by Virchow, large bony tumours grow on the head and face, giving to the patient a hideous appearance, but the extremities are quite normal.

Osteo-arthropathy and Myxoedema.

In Myxoedema the soft parts, and not the bones are affected, and the skin, to the touch, has an appreciable roughness, and hardness, and is lightened by oedema. The face is round and full, and the eyelids being oedematous, cause the eyes to be half closed. The naso-labial fold is quite obliterated, and in a patient affected with Myxoedema the mental condition is very slow, thinking and working being a great effort for the patient. There is no special curvature.
These points should distinguish Tympanena from Osteo-arthropathy, where in the latter you have no face changes, and it is chiefly the bones, and not the soft parts involved.

Osteo-arthropathy and Syphilitic Hyperostosis.

Syphilitic hyperostosis attacks the diaphyses of the bones, and does not show marked preference for the fingers.

Osteo-arthropathy and Erythromelalgia.

Erythromelalgia described in 1872, and again in 1878, by Weir Mitchell is distinguished from Osteo-arthropathy by livid colouration of the skin, by marked pain only in the upper arms and shoulders, and by disturbances of sensation and co-ordination in the affected parts, but especially in the fact that the fingers are much thicker at their bases than at their extremities.
Osteo-arthropathy and Elephantiasis.

Elephantiasis generally shows itself only in the lower part of the body, and sometimes only on one side. The limbs may be two or three times the normal size, or even more. The skin is altered in colour, and formation. In the blood of a patient with elephantiasis are the characteristic filariae.

Osteoarthropathy and Chronic Rheumatism.

The marked articular pains with exacerbations, the cracklings in the joints, and articular malformations seen in chronic rheumatism, where there is no enlargement or deformity of the terminal phalanges, should distinguish it from osteo-arthropathy.

Osteo-arthropathy and Hippocratic Fingers.

The most difficult point in the diagnosis of Pulmonary Hypertrophic Osteo-arthropathy is, to distinguish it from the so-called "Hippocratic" fingers, frequently seen in the
chronic heart and lung conditions.

The difficulty only exists in the very earliest stages of Osteo-arthritis, where the terminal phalanges are alone affected.

In the more advanced stages where the wrists, ankles, and other bones are involved there should be no difficulty.

In the "hippocratic" nails one often sees a tendency to the formation of the "parrot's beak," but in Osteo-arthritis the nail is much more hypertrophied, with both the vertical and transverse curvatures increased, and tends to cover the whole of the dorsal extremity of the finger, and even to overlap the fingers laterally, and again in the "hippocratic" fingers one does not find the upper part of the nail on a higher plane than the free edge, when the hand is held horizontally.

On the opposite page I give a photo of the hands of a patient— with a long history of Bronchitis—who has now phthisis of the 3rd degree—showing an exaggerated condition of "clubbing" of the fingers, with enlargement of the nails.
Prognosis

The prognosis of Pulmonary Hypertrophic Osteo-arthritis seems to depend entirely on the primary condition. By curing this Pleuro-pulmonary, or it may be another condition, the patient has a greater chance of getting rid of the hypertrophic malformations of the hands, feet, etc.

It seems from the cases recorded that the prognosis in the young is better than in the adult, but even in the latter Schmidt records a cure in a probable Syphilitic case and others have noted improvement.

As regards Osteo-arthritis itself it is not a fatal condition, but produces many functional disturbances, e.g. inability to use the hands, and even sometimes inability to walk, so that the patient is compelled to take to his bed.

In my opinion the prognosis of a cure is and must be a very doubtful one - but that the prognosis of an improvement - if the general condition guarantees an improvement - is more hopeful.
Progress.

So far it cannot be stated, with any certainty, which is the first part of the body affected in osteoarthropathy, but it seems probable that the extremities of the fingers and toes are the primary seat, for in many cases recorded, the terminal phalanges are the only places of enlargement. E.g. in the cases described by Baily, Marie, Monseur, Mathevon's second case—Gillet, and Moizard.

Gillet, in his article, says that in the child, the lesions do not seem to invade a number of bones; for in one of his cases, and those also by Monseur and Moizard, only the terminal phalanges were affected.

In the cases described in children they have generally been somewhat acute, and thus it seems that in all probability, the finger and toe ends are the primary seat of enlargement.

In the first case that I describe, the kyphosis was the first malformation.
noticed, but this may possibly have been due to a former caries, now quiescent.

Again no cases are recorded, which have had other bones affected, when the terminable phalanges have been intact.

It has not yet been shown the order in which other bones are affected.

Therefore noticed in his case that the enlargements underwent exacerbations, and this was followed by temporary retrogressive changes, though the hypertrophic conditions never came to a normal position, always remaining somewhat large.

Grilland in his case remarked that the fingers underwent enlargement several times a day, and both he, and the patient, noticed that they were greatest when the urticaria rash was at its height, pointing probably to a nervous condition. In Case I that I describe, the hands seemed smaller to the patient, and to me, when they were cold than when hot, but measurements did not support this.

In most of the cases it is markedly
chronic, but apparently can be of an acute nature. Janet has divided osteo-arthropathy into acute and chronic, the former only occurring up to the present in children, whilst the latter appears to be the condition seen in the adult.

"This acute condition occurring in children may be due to the greater cellular, circulatory, and osteopenic activity of the young age. Whatever it be this acute form exists and is characterized by two striking phenomena: 1) Rapid onset, and malformation of the terminal phalanx.

2) Possible retrocession of the lesions" (Janet).

Another point, which so far no one has been able to determine, is the extent this disease may attain. Kyphosis—thickening of the bones of the trunk seems to be late conditions, but the patient usually dies from the primary cause before they have arrived at these.

The advancement of the hypertrophy does not seem to pass certain limits, for once the greatest enlargement is attained the bones remain in statu quo.
Duration.

The duration of osteo-artropathy is very variable, in Sauterby's case, where the malformations were produced very rapidly and were generalized, it was only 7 months, the patient dying of sarcoma of the lung. In the case of Elliott, it was 9 months, death being due to multiple sarcoma. In the cases of Gillet, Monsso, and Moizard the duration was only a few months, the onset in all being rapid and ending in complete recovery in the cases of Monsso and Moizard, and almost complete, the terminal phalanx of the middle finger alone remaining enlarged—n that of Gillet.

In the majority of cases however, it is of some one or more years duration, and even in the cases of Friedrich, Erb, and Gouraud-Marie being twenty and thirty years.
Termination.

In many cases recorded, death has occurred, but it has always been due to a primary affection, and not especially to osteo-arthritisity.

In some cases however, complete recovery has been seen, — e.g. in the cases of Monsson — Mansan — and Moizard — in children, and that of Schmidt in the adult, the last being a syphilitic case; — whilst improvement has been recorded in others, — e.g. in the case of Maiman, — Demoussat-Binaur, — where although the purulent pleurisy was drained, the enlargement did not improve till a subcutaneous injection of an extract made from the healthy lung of a sheep was used, — which after the 26th injection healed up a persistent fistula — and arrests the progress of the hypertrophy.

In both cases that I have described the patients have shown improvement as regards their general condition and also in the size of the bony enlargements.
Etiology.

The etiology of osteo-arthropathy is, as yet, very incompletely known. Marie in describing the condition in 1890, said: "A lesion of the respiratory apparatus permitting probably, under the influence of micro-organisms, of the production at this spot of putrid or fermenting substances; secondly, the absorption and passage into the general circulation of these substances produced in the respiratory apparatus; thirdly, the electric action of these substances on certain part of the bones and of the articulations, determining the lesions of hypertrophic osteo-arthropathy."

The majority of cases recorded have followed some Pleural or Pulmonary affection as will be seen from the following table:—

6 cases have followed Purulent Pleurisy in which the operation for Empyema was performed and leaving a persistent fistula [Bailly, Sollier, Rangier, Lefèvre, Demouy and Binaud].

3 have followed Purulent Pleurisy in which
the operation for Empyema was performed but left no fistula — (persistent). [Moizard — (17)
Massai, Case II.]

8. have followed Purulent Pleurisy within
operation [Moizard — (17) Thayer — (20) Spriethoepe
monoseous — Gillet — Packard — Davis — (26).]

12. have followed Bronchitis — Empyema —
or Bronchial dilation [Friedrich — Erb —
Marie — Gerhardt — Gillet — Bamberger — (192).
Massai — Metz (with history of injury to
Ulnar nerve). Freytag — Felt — Thayer — (23).]

1. followed Abscess of the Lung [Kerr — (20).]

1. followed Pulmonary Cancer [Sarno — (22).]

1. followed Pulmonary Gaugrene [Bamberger — (23).]

10. have followed Pulmonary Tuberculosis [Breantzel
Thérèse — Bamberger — (20) Thoburn — (23) Murray —
Mettenheimer — Case I.]

3. followed Pneumonia — [Marina Stumbo —
Redmond — (19).]

5. have followed Sero-fibrinous or Hemorrhagic
Pleurisy [Elliott — Ewald — Waldo — Bamberger —
Orillard — (20).]

3. have followed Syphilis [Christen — Schmidt —
Smurnoff — (19).]
In Friedrich Seb's case of the younger brother Wagner - there was no lump condition - nor is there any recorded in the daughter of Freudenthal's case. The original article of Renner is now out of print, but in reference made to it in Schmitt: Jahrbuch - no mention of previous lump trouble is made.

In Gouraud-Maries case - and also that of Spuhmarin + Haukelsten pulmonary tuberculosis followed the onset of the malformations.

Marfan's third case is said to have followed a cystitis, with Suppurative Pyelo-nephritis, following the use of a catheter.

Willard's case although placed under those of sero-fibrinous effusion - was really a case following Pott's disease, and this lesion of the vertebral bodies, and the intervertebral discs, led by continuity, to chronic pleurisy, and pachymeningitis with neuritis of the L 2, L 3, S 2, Right intercostal nerves, and following this osteo-articular malformation.

So it might be consecutive to the pleuro-pulmonary condition or to the lesion.
of the vertebral column. Against the latter is the fact, that Pott's disease leads to pachymeningitis without these malformations.

It is thus seen from the above table that of 59 cases of osteoarthropathy recorded, 55 have been associated with pleural, pulmonary or pericardial affections.

But at the same time, some cases are recorded in which no heart or lung condition (e.g., those cases of Schmitt and Smirnoff following syphilis and that of Marfan following pyelo-nephritis) has been found.

If we then accept Marie's view of the causation of osteoarthropathy, viz, the circulation in the blood of some fermenting substances which have been produced in the region of the respiratory apparatus—how are we to account for these other cases? We must thus consider the syphilitic poison, or the poison produced from a suppurating pyelo-nephritis—able to play the same part as the respiratory poison.
Certainly the cases are very few in which syphilis does act in this way, and possibly as Schmidt has said, there may be certain dispositions or nervous influences wanting, as for example in the case recorded by Möbius (18) where after an injury to the Ulnar nerve—a patient with lung trouble—shows marked signs of osteo-arthropathy in the fingers supplied by this nerve; whilst the fingers not supplied by the Ulnar nerve do not show such marked hypertrophy, and also in the case of Brilland, which followed Pott's disease, with pains in the 6th, 7th, and 8th dorsal intercostal nerves, and apparently was connected in some way with an urticaria rash which the patient had, for when the rash was at its height the fingers were at their largest.

Stembo (22) at the end of his case, objected to the French authors sayng there was so much difference between osteo-arthropathy and Acromegaly, for many English and German cases of the former
have been diagnosed as the latter.

Even now Gerhardt and Erd"(31) do not agree with Marie in saying they are two distinct conditions.

Sternum thinks that we have to deal - if not in all - in many cases of Osteo-arthritis with degrees of Acromegaly - which through different influences (Respiratory affections - Syphilis venous) have undergone alterations - for in what form of disease do you find all symptoms equally developed.

Or again you may have one disease grafted on to another - so that the latter becomes modified in appearance and course.

These opinions of Sternum are certainly quite acceptable - and I have very little doubt that there is a very close resemblance and connexion between the two conditions.

Again in my opinion Osteo-arthritis is quite analagous to the clubbed finger condition, often seen in chronic heart and lung conditions.
Thorburn, in his paper, has been inclined to consider the condition a tubercular one, but from the greater number cases now recorded, it can be seen to follow many lump conditions which are not tubercular,—as well as having been noticed in syphilitic subjects— and in the cases recorded by Gillet and Moussois— in children,—although both were tubercular,—the cure of a purulent pleurisy, which they had, brought about a marked improvement or even a cure of the enlargements of the phalanxes,—showing apparently that the hypertrophy was consequent more on the pus in the pleural cavity,—than the pulmonary tuberculosis.

Pulmonary Hypertrophic Osteoarthropathy seems to affect persons of an adult age, more commonly than the young. Lefebure in 1891—said that the adult age seemed to be a necessary condition, but since that time eleven cases have been recorded, as having occurred
in children, viz. 

Fields' patient at the age of 1 year 5 months. 

Davis's at 4½. 

Mozards' two cases at 5 + 6. 

Gillet's two cases at 7 + 13. 

Monsars' case at 14. 

Trautzl remarks that the daughter of his case aged 11 had large hands and from a photo given looks like osteo-arthritis. 

Marfan records three cases in children but fails to give their ages. 

As regards the age at which it occurs in the adult -- there is a difficulty in giving a stated age. 

It appears to be most common between the ages of 20 + 40. But cases have been recorded at a later period in life for example those cases by Christen, aged 54. Stenbo + Brilland -- 56. 

Marina 63. + Baumreiten -- 67. + others. 

As regards sex, osteo-arthritis appears to attack the male more commonly than the female. Of the 11 children however, 5 were girls, but of the 48 cases seen in adults, only 5 occurred in women, viz the cases of Christen. Schmidt + Payen. 

Stenbo + Redmond.
Pathology.

Our knowledge of the Pathology of Osteoarthritis must necessarily be limited, owing to the small number of autopsies that have been made. The most complete pathological conditions have been described by Bauer, Lefebvre and Théisse, and from them, we learn that the most constant morbid conditions are somewhat as follows.

Bauer noticed increased bony production, especially in the region of the terminal phalanges, where it appears like a mushroom varying in size from a pea's head to a pea.

This osteophytic deposit is noted also on the femur, tibia, fibula, radius, and patella, causing a slight thickening of the transverse diameter of these bones. The nutrient foramina, more numerous and larger in size, give to the bone a spongy appearance.

The articular surfaces are slightly increased in area.
these diaphyses is also increased.
The lining membrane (endosteum) of the medullary canal is two or three times thicker than normal. The thickening appears due to the superadded stratified bony deposits, which replace the compact bone.

On section, the striation of the dense portion of the diaphysis is, according to Bamberger, divisible into four distinct layers of equal thickness. The periosteum is also thickened, and is not very adherent to the bone. The bone immediately under the periosteum is spongy and friable, and can be easily indented with the nail.

The stratified bony layers of periosteal origin, thickest at the level of the diaphyses, become thinner gradually towards the extremities, till they cease about 1 centimetre from the articulation.

The articular cartilages at some joints (Radius-Ulnar) show diminution in their polished condition, whilst—in others (Scaphoid)—one can see slight erosion of the cartilage.
In the terminal phalanges there is thinning of the compact layer of bone, with a number of vacuoles, which as in the bones of the forearm, increase the thickness of the spongy tissue but not that of the bone itself.

**Histological Examination.**

The external configuration of the bone is preserved, but there was a general, without local hypertrophy.

The articular surfaces are not affected however by this hypertrophy, but appear nearly normal, except in certain special cases, where erosions of the cartilages have been noted.

**Microscopic characters of Bone.**

In many parts rarification of the bone was noted, the compact layer being riddled with holes like the spongy tissue of the epiphyses. In some parts the lamellae were thicker than in the normal epiphyses, and showed great increase in the size of the Haversian Canals—some of which were eroded, so that
they opened into the medullary cavity. The concentric rings were quite clear, showed osteoblasts.

The Periosteum was thickened in its lower layer (i.e. the osteogenic layer). Staining deeply with picric-carmine, the sub-periosteal marrow—in many places penetrated into the subjacent layers of bone, which are thus rendered less compact, reminding one of the appearances seen in the formation of bone.

The marrow in the centre of the bones is very abundant, and contains a large number of large fat droplets, some of which show crystals of fatty acids.

In the peripheral layer, on transverse section of bone, the fat droplets disappear. Embryonal elements are very abundant.

The articular cartilage microscopically is normal, but on its deep aspect, more or less irregular vacuoles are present, into which the bone marrow penetrates, like cartilage in developing bone.
This histological examination shows the fatty degeneration, the sarification of bony tissue, and the osteogenetic activity of the subperiosteal layer. It appears clear to us that the phenomena of the pathological anatomy corresponding to these changes are rapid sarification, and rapid increase in the production of new bone at the periphery.

Briefly - the section of bone shows 3 layers:

1) Inner compact layer - with large, but not very numerous Haversian Canals.
2) Middle zone - formed chiefly of embryonic elements, containing fat globules, and enlarged capillaries.
3) Outer layer - friable in appearance, with perpendicular striæ.

I cannot do better than quote the Resumée, as given by Lefèbvre (translated).

That which strikes one is the existence of two kinds of quite different bone.
1) The more central, with the Haversian canals directed according to the axis of the bone.
2). The peripheral, of periosteal origin, very active in production, and showing the Haversian canals perpendicular to those of the preceding system (1), reminding us, thus, of the appearance of certain exostoses of a periosteal origin, as for example those of syphilis. One notices an abundance of embryonal elements in the bone marrow peripherally, and an abundance of fat in the central portion.

The term of Subacute osteo-myelitis, in its more general meaning, would suit perfectly the histological lesion of the bone, if custom had not considerably restricted its meaning. We think we shall make it quite clear by qualifying the principal change of Subacute medullitis with hyperplasia and condensation of the sub-periosteal bone. The terminal phalanges of the fingers show identical changes - but not so well marked.

The Articular cartilages except for the vacuoles seen on the deep surface
of the cartilage of the Radius, appear to be quite normal.
She bony and cartilaginous parts besides those of the Joints (Hyoid - Laryngeal - Nose + Ears) in this patient do not show any change.

Chemical Analysis of Bone.

M. Chabrie made a chemical analysis of the lower end of the Ulna, the most diseased part of the bone, and obtained the following centesimal results as compared with normal bone.

<table>
<thead>
<tr>
<th></th>
<th>Normal Bone.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bergellius, Becquerel.</td>
</tr>
<tr>
<td>Total Organic (Collagenous Tissue)</td>
<td>35</td>
</tr>
<tr>
<td>Matter 49% (Fat)</td>
<td>14</td>
</tr>
<tr>
<td>Total (Phosphate of Magnesia)</td>
<td>29.27</td>
</tr>
<tr>
<td>Phosphate of Lime</td>
<td>10.83</td>
</tr>
<tr>
<td>Mineral</td>
<td>Fluoride of Calcium</td>
</tr>
<tr>
<td>Matter</td>
<td>Carbonate of Lime</td>
</tr>
<tr>
<td>Part insoluble in HNO₃</td>
<td>51</td>
</tr>
</tbody>
</table>
In the bone Chabrié examined, these salts decomposed themselves into:

- Phosphoric Acid \( \ldots 20.82 \cdot \)
- Lute \( \ldots 11.39 \cdot \)
- Magnesia \( \ldots 13.41 \cdot \)
- Carbonic Acid \( \ldots 4.36 \cdot \)

Thus, it is seen that in Osteo-arthropathy, the bone compared with the normal shows:

- Increase of Organic Matter.
- Diminution of Mineral Matters.
- Diminution of Phosphate of Lute.
- Considerable increase of Phosphate of Magnesia.
- Diminution of Carbonate of Lute.

In the histological examination, there was shown to be a super-abundance of fat and so in the chemical, where especially the fat of the organic matter is increased. Instead of having a lute bone as in the normal, in Osteo-arthropathy according to this analysis, the lute is to a great extent is replaced by magnesia and we have a magnesia bone.
Lefèvre has made some very careful and interesting comparisons of the chemical modifications of the bone of Osteo-arthropathy, with that of Rickets, Osteo-malacia, and Osteitis Deformans of Papet, which I translate and reproduce here.

<table>
<thead>
<tr>
<th></th>
<th>Rickets</th>
<th>Osteo-malacia</th>
<th>Papet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Matter</td>
<td>6342</td>
<td>3501</td>
<td>4883</td>
</tr>
<tr>
<td>Inorganic Matter</td>
<td>365.58</td>
<td>583.30</td>
<td>2083</td>
</tr>
<tr>
<td>Phosphate of lime</td>
<td>28</td>
<td>4783</td>
<td>1786</td>
</tr>
<tr>
<td>Carbonate of lime</td>
<td>6.35</td>
<td>7.62</td>
<td>3.04</td>
</tr>
<tr>
<td>Phosphate of magnesia</td>
<td>1.07</td>
<td>1.23</td>
<td>0.23</td>
</tr>
<tr>
<td>Salts</td>
<td>1.05</td>
<td>1.82</td>
<td>1.98</td>
</tr>
<tr>
<td>Fat</td>
<td>1.09</td>
<td>29.18</td>
<td>612</td>
</tr>
</tbody>
</table>

The Bone then in Osteo-arthropathy is less rich in organic substance, and in phosphate of lime, but more rich, in inorganic matter, phosphate of magnesia, carbonate of lime, and in fat, than in Rickets. Compared with the bone in Osteo-malacia, the Osteo-arthropatic bone has about the same proportions of
organic and inorganic matters, but less phosphate of lime, and a much greater quantity of phosphate of magnesia, carbonate of lime, and fat.

The Bone in Osteo-arthropathy contains more total organic matters, less mineral matters, and phosphate of lime, but on the contrary, more phosphate of magnesia, and carbonate of lime than the bone in Osteitis Deformans of Papez.

If now we compare the bone of Osteo-arthropathy and that of Papez's disease with a normal bone, we find, thanks to the chemical characters observed, that these two affections are constituted by two parallel deviations from the normal type, which we would thus schematize:

<table>
<thead>
<tr>
<th>Normal Bone</th>
<th>Osteo-arthropathy</th>
<th>Papez's Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase of Magnesia salts.</td>
<td>Increase of lime salts.</td>
<td>Increase of lime salts.</td>
</tr>
<tr>
<td>Increase of fat.</td>
<td>Increase of fat.</td>
<td>Increase of fat.</td>
</tr>
<tr>
<td>No modification of carbonates.</td>
<td>Diminution of Carbonates.</td>
<td>Diminution of Carbonates.</td>
</tr>
</tbody>
</table>
Treatement.

The treatment of Osteo-arthritis is apparently first to treat the cause. - If purulent pleurisy - drainage, - if some other lung condition treat it, - if syphilis, - anti-specific remedies. (2d) Demoure & Binard treated their case first by drainage of the pleural cavity, but a persistent fistula remained, and the figures steadily increased in size. - They then made superficial injections of tissue extract, made from the lump of a healthy in the following way:

Take 20 grammes of healthy sheep’s lump, cut up into small pieces, - macerate for half an hour in 60 grammes of Glycerine. Add 120 grammes of boiling water, and allow the whole to macerate for half an hour. Filter and introduce into the apparatus of 0’Arsenal. Filter again at a pressure of 60 atmospheres, after having left the solution in contact with CO₂ for 20 minutes.

This method of treatment, though not lessening the hypertrophy, arrested its
progress, and the movements of the various joints, which previously had been very limited, became decidedly freer. His general condition improves, and a persistent fistula, which had existed for many years, closed perfectly after the 28th injection.

In the first case described by me, the patient was phthisical, and creased in 3 minims doses twice a day, (afterwards increased to 6 minims) as an antiseptic, and simple tonic treatment, with plenty of fresh air and good food improved his general condition considerably, and thus there was a marked improvement in the mobility of the joints, and slight diminution in the bony entrapments. In this case I might add that iodine (equal parts of the tincture and spirit) besides being used for the chest, was also painted on the backs of the hands and fingers every second day. This I believe has never been recorded in the treatment of any previous case.
The condition of the hands, especially as regards the movements of the fingers, improved. These may have been solely due to his general improvement, or possibly the absorbing effects of the Iodine may have had something to do with it. Following this massage, together with passive and active motion, were tried — the hands and fingers being massaged carefully, and the joints thoroughly moved twice a day. Certainly as a result of this the movements of the hands and fingers were very much freer.

In the 2nd Case, the patient was treated for purulent pleurisy by drainage of the cavity, before the malformations of the terminal phalanges appeared. However, there was a condition of phthisis afterwards, and his treatment was simply that of tonics. His general condition, and also the enlargements of the terminal phalanges, and wrists improved remarkably in the last five months.
Conclusion.

Osteo-arthropathy occurs as a rule after Flueal or Pulmonary Diseases, but there are cases recorded where no Heart or Lung condition has been seen. Marie's theory, that the cause of the hypertrophy is possibly the absorption of a ferment or toxin, seems to be probably true, but he went further, and said that this ferment was of pulmonary origin. Apparently it need not be, according to the cases of Schmidt, Smirnoff, and Morfou, where there were no pulmonary lesions.

For this reason, I am inclined to think that this morbid state should no longer be called Pulmonary Hypertrophic Osteo-arthropathy, the wording "pulmonary" being misleading. Possibly Secondary Hyperplastic Osteitis as proposed by Arnold, or more simply Hyperplastic Osteo-arthritis as suggested by my senior colleague Dr. Walters would be more accurate.

Mobius thought that possibly the hypertrophies might be due to primary lesions of the trophic nerves; and Orillard in his case
considered the enlargements resulted from caries of the vertebral column.

Osteo-arbothropic enlargements were considered by Thorburn as being tubercular — but I think no other authority has taken that view.

Osteo-arbothropy, in my opinion, is a condition, very analogous to, closely resembling, the "clubbed" fingers so often seen in chronic heart or lung diseases, and I should be inclined to classify it as possibly an intermediate condition between "clubbed" fingers and hypertrophies depending upon lesions of the nervous system.

As regards the symptoms of osteo-arbothropy, I think no one has raised an objection to Marie's statement that the kyphosis is dorso-lumbar in position. In almost as many cases recorded, it is purely dorsal.
Summary of Recorded Cases
<table>
<thead>
<tr>
<th>Recorded by</th>
<th>Sex</th>
<th>Age</th>
<th>Previous Illnesses</th>
<th>Constant Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bailly</td>
<td>Male</td>
<td>21</td>
<td>Scurfus; Purulent Pleurisy - Trench for 10 years.</td>
<td>Malformation of the toes and fingers. &quot;Watch-glass&quot; nails.</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>---------------</td>
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<td></td>
<td></td>
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<tr>
<td>1 year after pubertal staging</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 years</td>
<td>Late slow muscular atrophy, in good health, No trace of Thyroid, Late Dorsolumbar Kyphosis</td>
<td>The malformation began before the thoracic affection in two cases in the same family.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 years</td>
<td>Hyperextension of terminal phalanges, Thickening of skin of hands, feet, Hyperchondrosis, Acne of the face, Retrosternal dullness</td>
<td>Abundant phosphates in the urine, Brother of the previous case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 years</td>
<td>Muscular atrophy; Some fever after Much thirst, cutaneous pigmentation, Bronchitis, Hyperchondrosis, No Thyroid (clinically)</td>
<td>Alkaline urine - No sugar, Death, Atrophy of Thyroid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recorded by</td>
<td>Sex</td>
<td>Age</td>
<td>Previous Illness</td>
<td>Constant Symptoms</td>
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<tr>
<td>-------------</td>
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<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Elliott</td>
<td>Male</td>
<td>67</td>
<td>Right Pleural Effusion</td>
<td>Malformation of the joints of the upper limb from the elbow, of the lower limb from the knees. Thickening of Clavicles &amp; Ribs.</td>
</tr>
<tr>
<td>Frantzgel</td>
<td>Male</td>
<td>58</td>
<td>Alcoholism, Pulmonary Tuberculosis (advanced)</td>
<td>Wrist - Metacarpals, Fingers - Nails - Joints of feet deformed more marked on the right side.</td>
</tr>
<tr>
<td>Age</td>
<td>Complications</td>
<td>Observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 years</td>
<td>Fever - Profuse diarrhoea. Halted cutaneous nodules in hands and feet.</td>
<td>Death: Multiple Sarcoma.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration: 14 months</td>
<td>Hyperaesthesia (Trunk). Enlarged Inguinal glands.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 years after first</td>
<td>Polydipsia (much thirst).</td>
<td>A child attacked with the same disease (see below).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tracheal symptoms</td>
<td>Adherent Pericardium.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 years</td>
<td>Cord-like hypertrophy. Slight Kypho-scoliosis.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 years</td>
<td>Sharp pains - likened to the lightning pains.</td>
<td>Hyperaesthesia of body in various patches.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recorded by</td>
<td>Sex</td>
<td>Age</td>
<td>Previous Illness</td>
<td>Constant Symptoms</td>
</tr>
<tr>
<td>------------</td>
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<td>-------------------</td>
</tr>
<tr>
<td>Ewald</td>
<td>Male</td>
<td>50</td>
<td>Carcinoma, Hemorrhagic Pleural Effusion</td>
<td>Malformation of the Hands - Feet and Nails</td>
</tr>
<tr>
<td>Gouraud-Marie</td>
<td>Male</td>
<td>50</td>
<td>Intermittent Fever, Probable but consecutive Tuberculosis</td>
<td>Malformations of the Hands - Feet - Nails - Elbows, Enlargement of the Tibio-tarsal joint, Kyphosis</td>
</tr>
<tr>
<td>Waldo</td>
<td>Male</td>
<td>54</td>
<td>Calcaneum deposition, heart values, aortic regurgitation</td>
<td>Knees - Feet - Hands, Fingers - Nails - Wrists, Heel crests deformed</td>
</tr>
<tr>
<td>Spellmann &amp; Hauschalter</td>
<td>Male</td>
<td>45</td>
<td>Typhoid Fever, Damp Home, Mover (occupation), Rheumatism</td>
<td>Malformation of Wrists Feet - Knees - Elbows, Fingers - Larynx and Metacarpales, Nails - thickened and curved (&quot;watch glass&quot;)</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------</td>
<td>---------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 years</td>
<td>Thickening of Skin</td>
<td>Mediastinal carcinoma tumours.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muscular Atrophy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retro-sternal dullness.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absence of the Thyroid.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 years</td>
<td>Hyper-extension of terminal phalanges</td>
<td>Tuberculosis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intercurrent pulmonary congestion.</td>
<td>The malformations preceded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 years</td>
<td>Excessive protrusion of fingers.</td>
<td>the thoracic affection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thickening of Skin.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acne; Much Thirst.</td>
<td>Abolition of erotic excitement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54 years</td>
<td>Intellectual troubles</td>
<td>Convulsions - Death.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bulbar paralyses.</td>
<td>Autopsy: Cavities in the cerebral substance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muscular Atrophy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Thyroid - but slight increase of left lobe of Thyroid.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 years</td>
<td>Muscle atrophy; awkwardness</td>
<td>Small Thyroid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pains - Dry scaly skin.</td>
<td>Abolition of sexual desire.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sensibility to cold.</td>
<td>Malformations precedes the thoracic affection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Burning sensations at feet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Great thirst - Hair grows rapidly.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retro-sternal dullness.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Record by</td>
<td>Age</td>
<td>Previous Illness</td>
<td>Constant Symptoms</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-----</td>
<td>-----------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Léfebvre</td>
<td>42</td>
<td>Intermittent Fever</td>
<td>All the peripheral joints from knees and elbows, and metacarpals deformed. &quot;Watch-glass&quot; nails. Raised base of nail.</td>
<td></td>
</tr>
<tr>
<td>Thérèse</td>
<td>38</td>
<td>Pulmonary Tuberculosis</td>
<td>Terminal phalanges - Wrists Malleoli - Metacarpal, Phalanges joints &amp; knees deformed.</td>
<td></td>
</tr>
<tr>
<td>Léfebvre</td>
<td>30</td>
<td>Pericarditis, Peritonitis</td>
<td>Only terminal phalanges of fingers &amp; toes deformed. Raised base of nail.</td>
<td></td>
</tr>
<tr>
<td>Mousson</td>
<td>14</td>
<td>Pulmonary Tuberculosis</td>
<td>Malformation of terminal phalanges.</td>
<td></td>
</tr>
<tr>
<td>Marie</td>
<td>51</td>
<td>Probable Bronchial dilatation</td>
<td>Simple malformation of nail phalanges. Raised base of nail.</td>
<td></td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hyperextension of 3rd phalanges</td>
<td>Intellectual troubles</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ichthyosis - Pigmentation</td>
<td>Nervous tremors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 years</td>
<td>Albuminuria (slight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sensation of heat in extremities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muscular atrophy - Jerky walk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 years</td>
<td>Deviation towards the Ulnar border</td>
<td>Histological &amp; Chemical Analyses of the diseased Bones</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jerky walk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 years</td>
<td>Amyloid degeneration of the kidneys (probable) &amp; Liver</td>
<td>Return of phalanges to normal appearance after healing of the purulent pleurisy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recorded by</td>
<td>Age</td>
<td>Sex</td>
<td>Previous Illnesses</td>
<td>Constant Symptoms</td>
</tr>
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<tr>
<td>Gerhardt</td>
<td>62</td>
<td>Male</td>
<td>Alcoholism, Syphilis, Intermittent Fever, Bronchial Catarrh, Damp Lodgings</td>
<td>Hands - Terminal phalanges - Wrists - Nails</td>
</tr>
<tr>
<td>Rheinhold</td>
<td>47</td>
<td>Male</td>
<td>Mumps, Orchitis, Pneumonia - Purulent Pleurisy - Retention of pus - Many fistulae</td>
<td>Hands - Feet - Fingers - Toes - Wrists - Knees - Malleoli + Metacarpals</td>
</tr>
<tr>
<td>Bamberger</td>
<td>23</td>
<td>Male</td>
<td>Bronchiectasis - Lobar Terminal phalanges of fingers - Toes enlarged - also wrists -ankles</td>
<td>Nails increased</td>
</tr>
<tr>
<td>Bamberger</td>
<td>67</td>
<td>Male</td>
<td>Pleurisy (old)</td>
<td>Malformation of 3rd phalanges of toes - fingers - Wrists and ankles</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>62 years</td>
<td>Abnormal local development of the feet.</td>
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<tr>
<td></td>
<td>Paresis at the diseased parts</td>
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<td></td>
<td>Pain; Tremors; Muscular stiffness</td>
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<tr>
<td></td>
<td>Great number of nodules on the neck</td>
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<tr>
<td></td>
<td>Atrophy of Thyroid</td>
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<tr>
<td>34 years</td>
<td>No functional troubles.</td>
<td>Father said to have had large extremities</td>
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<tr>
<td>9 years after</td>
<td>Internal extremity of right</td>
<td>Death;</td>
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<tr>
<td></td>
<td>Temporal hypertrophy.</td>
<td>Erosion of cartilages of elbows &amp; wrist joints.</td>
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<tr>
<td></td>
<td>Painless</td>
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<td></td>
<td>Frequency of urination</td>
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<td>Abolition of sexual desire</td>
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<tr>
<td></td>
<td>Diminution of Stature</td>
<td></td>
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<tr>
<td>12 years</td>
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<td>Post-mortem - Sclerosis of</td>
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<td></td>
<td></td>
<td>cortical substance. Spinal</td>
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<td></td>
<td></td>
<td>substance more dense.</td>
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<td></td>
<td>Pain over the Tibia on pressure</td>
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<tr>
<td></td>
<td>Intermittent oedema of the legs</td>
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<tr>
<td>Recorded by</td>
<td>Sex</td>
<td>Age</td>
<td>Previous Illnesses</td>
<td>Constant Symptoms</td>
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</tr>
<tr>
<td>Bamberg</td>
<td>Male</td>
<td>39</td>
<td>Pulmonary cataract, + Toes (like drumsticks)</td>
<td>Glaucome of lump, enlarged. Frequent homoptysis.</td>
</tr>
<tr>
<td>Bamberg</td>
<td>Male</td>
<td>30</td>
<td>Cough from 12 to 17 + years and from age of 17 to present time</td>
<td>Terminal phalanges of fingers &amp; malleoli enlarged.</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td></td>
<td>Irregular + intermittent fever.</td>
<td>Chronic + Acute Phthisis found at autopsy</td>
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<tr>
<td></td>
<td>No Bacilli - now though formerly found.</td>
<td>Thyroid small.</td>
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<tr>
<td></td>
<td>No Bacilli found in 21 years.</td>
<td>The fingers began to enlarge about the time the sputum became foetid.</td>
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<tr>
<td></td>
<td>Sensations of heat &amp; cold.</td>
<td>Sensations of heat &amp; cold.</td>
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<td></td>
<td>Godness</td>
<td>Godness</td>
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<td></td>
<td>Pain in knees &amp; ankles especially on movement.</td>
<td>Pain in knees &amp; ankles especially on movement.</td>
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<td></td>
<td>At the autopsy - the terminal phalanges found to be much thickened Like phalanges.</td>
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<tr>
<td></td>
<td>14 years. Pain on pressure over the bones.</td>
<td>14 years. Pain on pressure over the bones.</td>
<td></td>
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<tr>
<td></td>
<td>Feel flat.</td>
<td>Feel flat.</td>
<td></td>
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<tr>
<td></td>
<td>No Bacilli in the greenish thick foetid sputum.</td>
<td>No Bacilli in the greenish thick foetid sputum.</td>
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<tr>
<td></td>
<td>Very pronounced night sweats.</td>
<td>Very pronounced night sweats.</td>
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<tr>
<td></td>
<td>Constant pain in all the limbs.</td>
<td>Constant pain in all the limbs.</td>
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<tr>
<td>Recorded by</td>
<td>Age</td>
<td>Previous Illnesses</td>
<td>Constant Symptoms</td>
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<tr>
<td>Mettenheimer</td>
<td>30.</td>
<td>Hemoptysis followed by Phthisis</td>
<td>Marked clubbing of the terminal phalanges of fingers and toes - with enlargement, redness, and increased curvature of the nails. Lower ends of left forearm bones hypertrophied.</td>
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<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>28 years</td>
<td></td>
<td>The enlargement especially of left forearm got worse every now and then - and during this the nails became redder and their roots could easily be felt.</td>
<td></td>
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</tr>
<tr>
<td>18 years</td>
<td>Venous hum in the neck. Systolic murmur (functional)</td>
<td>The hand and feet attained their size in a few weeks. Urine - Sp Gr. 1022. Phosphates in excess. This case was reported as Acromegaly.</td>
<td></td>
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<tr>
<td>2½ years</td>
<td>Effusion in both knees. Thyroid absent. Pain in back.</td>
<td></td>
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<tr>
<td>Pneumonia</td>
<td>Headache. Absence of erotic excitation.</td>
<td>(The original article by Reimer is I believe out of print - but reference is made to this case in the Schmidt Jahrbuch.)</td>
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<tr>
<td>3½ years</td>
<td>Skin brownish colour. Hair thick.</td>
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<tr>
<td>Sex</td>
<td>Age</td>
<td>Previous Illnesses</td>
<td>Constant Symptoms</td>
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</tr>
<tr>
<td>Male</td>
<td>48</td>
<td>Influenza (a year ago)</td>
<td>The terminal phalanges of fingers and toes enlarged and bony. Nails enlarged and their curvature increased</td>
<td></td>
</tr>
<tr>
<td>Freytag</td>
<td></td>
<td>Cough with greenish-yellow expectoration</td>
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<tr>
<td></td>
<td></td>
<td>Phthisis</td>
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<tr>
<td></td>
<td></td>
<td>Bronchectasis</td>
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<td></td>
<td></td>
<td>Gangrene of Lung</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>56</td>
<td>Suppurating inferior lobe</td>
<td>Finger and toe ends &quot;drumstick&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fracture of left leg</td>
<td>Nails enlarged and curved and show &quot;watch glass&quot; and &quot;parrot's beak&quot;</td>
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<td></td>
<td></td>
<td>Cough with some slight hemothysis</td>
<td>Worms enormous</td>
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<td></td>
<td></td>
<td></td>
<td>Knees enlarged</td>
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<td></td>
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<td></td>
<td>Dorsal kypho-scoliosis</td>
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<td></td>
<td></td>
<td>Diminishes height</td>
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<td></td>
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<td></td>
<td>Right elbow and knee incompletely extended</td>
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<tr>
<td>Male</td>
<td>23</td>
<td></td>
<td>Ends of fingers typical, but the distribution not uniform on feet. Patella - tibial tibial bone hypertrophied, diaphysis as well as epiphyses. Face elongated with high cheekbones</td>
<td></td>
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<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>55 years</td>
<td>Tubercle Bacilli found in the Sputum</td>
<td>Death</td>
<td></td>
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<tr>
<td></td>
<td>Slight history of Alcoholicism</td>
<td>No Tubercle Bacilli</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Secondary history of chest disease</td>
<td>Death: Chronic Pleurisy probably due to irritation in the region of the osseous deformity of the vertebral column (Pott's Disease)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difficulty in walking</td>
<td>During life the extension of the Right elbow varied with the size of the fingers</td>
<td></td>
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<tr>
<td></td>
<td>Great pain - especially in the course of 6th &amp; 7th Dorsal Interarticular Nerve</td>
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<td></td>
<td>Urticaria - increasing at same time as fingers</td>
<td></td>
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<tr>
<td></td>
<td>Reflexes slightly diminished</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Right sweats</td>
<td></td>
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</tr>
</tbody>
</table>

Patient noticed deformity when aged 9 and could not straighten the fingers.

Spreading perforation of hand + soft palate - KI + Hg - healed this.

Muscles of lip + forearm thin.
<table>
<thead>
<tr>
<th>Recorded by</th>
<th>Sex</th>
<th>Age</th>
<th>Previous Illnesses</th>
<th>Constant Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schmidt</td>
<td>Female</td>
<td>48</td>
<td>Rheumatism (age 30) with relapses</td>
<td>Terminal phalanges of fingers &amp; toes show markedly dramatic condition</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>age 35 had severe headaches</td>
<td>Wrist, Hand – Elbow synovitis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Syphilis at 25 yrs.</td>
<td>Nails enlarged &amp; widened</td>
</tr>
<tr>
<td>Möbius</td>
<td>Male</td>
<td>57</td>
<td>Pneumonia (8 years ago). Cough &amp; offensive expectoration for 2 yrs</td>
<td>Enlarged terminal phalanges of Ulnar fingers (Right)</td>
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<tr>
<td></td>
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<td></td>
<td>Nails of these = &quot;parrot's beak&quot;</td>
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<td></td>
<td></td>
<td>Left Hand – very slight enlargement of end phalanges also of other fingers of R. hand</td>
</tr>
<tr>
<td>Packard</td>
<td>Male</td>
<td>29</td>
<td>Slight hacking cough rheumatoïd (age 15) dysentery at the ages of 24 &amp; 26.</td>
<td>Terminal phalanges of fingers and also of the toes markedly enlarged and bulbous</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Old - empyema.</td>
<td>Increased curvature of nails quite early. Hands &amp; wrists characteristic</td>
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<td>Ankles especially tibial enlarged</td>
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<td></td>
<td></td>
<td>Dorso - Cervical Kyphosis</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>48 years</td>
<td>After first bump seen she had ulcer of tongue - which no improvement - but with KI healed. Contracted Syphilis at age of 25.</td>
<td>Lumps &amp; cancer quite healthy. Diagnosed as syphilitic from history (miscarriage). KI given &amp; under its influence the enlargements disappeared.</td>
<td></td>
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</tr>
<tr>
<td>15 years</td>
<td>Night sweats - very marked. Rheumatoid pains in the joints. Hands and other joints stiff for 5 or 8 years after cough commenced. Memory failing.</td>
<td>Whilst the patient had Dysentery the expectoration ceased. Expectoration - fluid. No Bacilli or elastic fibres found in the sputum.</td>
<td></td>
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<tr>
<td>Recorded by</td>
<td>Sex</td>
<td>Age</td>
<td>Previous Illnesses</td>
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</tr>
<tr>
<td>Gillet</td>
<td>M</td>
<td>12</td>
<td>Bronchitis on/off, cause the ape of H. always catching cold &amp; always short-winded and asthmatic so to speak—since this time.</td>
<td>Terminal phalanges of fingers markedly &quot;dum-dum-like&quot;. Also toes especially &quot;Bp to&quot;, Nails large &amp; curved, upper part on higher plane than free edge, giving &quot;watch-glass&quot; appearance. Nails deeply striated. Ankles slightly enlarged.</td>
</tr>
<tr>
<td>Gillet</td>
<td>F</td>
<td>14</td>
<td>Uterina, Pulmonary Tuberculosis.</td>
<td>Terminal phalanges of toes. Fingers slightly like &quot;brum-hack&quot;. Nails curved like &quot;watch-glass&quot;. Thumbs &amp; middle fingers not marked. Roots of nails higher than free edge.</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>4 months</td>
<td>Signs in the chest of pneumonia. Purulent Pleurisy cleared up with that the fever ends became smaller except the left middle finger.</td>
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<tr>
<td>5 years</td>
<td>The skin over the back in the vicinity of the phalanx in the their after the glossy &amp; rosy in colour which increased in haeumosecence when the temperature was raised &amp; diminished as it fell.</td>
<td>Rice contained pus &amp; cocci + ochele &amp; cocci chiefly the former. After operation for Pnurulent Pharyng the child became better + the fever ends became normal with the exception of the two middle.</td>
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<tr>
<td>Recorded by</td>
<td>Age</td>
<td>Previous Illness</td>
<td>Constant Symptoms</td>
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</tr>
<tr>
<td>Moizard</td>
<td>6</td>
<td>Pneumonia; Purulent Pleurisy</td>
<td>Terminal phalanx of fingers - enlarged &amp; &quot;drum stick&quot;. Nail markedly curved (&quot;watch glass&quot;) carmine rose colour - No Striation.</td>
<td></td>
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<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>6 years, 1 month after pneumonia</td>
<td>Patient expectorate purulent sputum</td>
<td>(This child was lost sight of &amp; hence the case is not complete).</td>
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<tr>
<td>20 years</td>
<td>Pain + fluid in knees, Thyroid - small, Hypothemar + Themar eminence lessened, Sinus in loin opposite 2nd Lumbar Vertebra discharging strong fluid.</td>
<td>Although patient was phthisical - he did not complain of the chest &amp; its condition was only discovered by chance - as osteo-arthritis is so often associated with lupus disease.</td>
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<tr>
<td>35 years</td>
<td>Great thirst + anorexia, Fluid in knee joints, Slight lateral curvature of the spine - probably due to the lupus condition (Thorburn was inclined to consider these enlargements as of a Tubercular nature).</td>
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<tr>
<td>Recorded by</td>
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<td>Age</td>
<td>Previous Illnesses</td>
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<tr>
<td>Thorburn</td>
<td>Male</td>
<td>30</td>
<td>Phthisis</td>
<td>Terminal phalanges of toes &amp; fingers, feet &amp; wrists enlarged.</td>
</tr>
<tr>
<td>Field</td>
<td>Male</td>
<td>5</td>
<td>Whooping Cough and Bronchitis (severe) when 8 months old. Subject to Bronchitis since.</td>
<td>Hands, wrist, fingers, knees, feet &amp; ankles enlarged, nails widened &amp; curved vertically &amp; transversely. Both lips large, especially lower. Malar bone prominent.</td>
</tr>
<tr>
<td>Marina</td>
<td>Male</td>
<td>63</td>
<td>Pneumonia.</td>
<td>Fingers especially end phalanges enlarged, toes also slightly. Nails striated transversely but not much curved.</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>22 years</td>
<td>Pain in knees + ankles</td>
<td>Mouse-purulent + Sputum</td>
<td></td>
<td></td>
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<tr>
<td>6½ months</td>
<td>Pain in knees + ankles</td>
<td>No bacilli</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63 years</td>
<td>Hyperemia of Optic Nerve</td>
<td>Under H1 treatment</td>
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<tr>
<td>6 months</td>
<td>Slight Cervico-Dorsal + Pneumonia</td>
<td>The condition of the hands improved.</td>
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</tr>
</tbody>
</table>

**Left Inguinal Hernia**

**Phimosis**

Since the operation of circumcision, the child was the cause of the child. Bronchitis, being admitted into hospital, anemia of upper arms + thighs.

Field says, "This case, with the exception of marked curvature of the neck, absence of enlargement of the nose, looks like Adrenopathy, but the curvature of the neck, hip, knees, wrists + - Pulmonary condition bring it under osteo-arthritis."
<table>
<thead>
<tr>
<th>Recorded by</th>
<th>Sex</th>
<th>Age</th>
<th>Previous Illnesses</th>
<th>Constant Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohrtien</td>
<td>Female</td>
<td>57</td>
<td>Rheumatism (thrice) especially lower limbs. Lupus (cured-no return) Swelling in Liver region Erysipelas + Abscesses Aortic Disease (?).</td>
<td>Imppers - especially the terminal phalanges are enlarged. also toes Nails soft flare (watch-glass) Wrists greatly enlarged also knees + ankles.</td>
</tr>
<tr>
<td>Stembo</td>
<td>Female</td>
<td>56</td>
<td>Inflammation of Lumps followed by pains in the joints especially of hands and feet.</td>
<td>Hands “spade-like”. Terminal phalanges of fingers + toes markedly clubbed (Drumstick) Nails very large curved (watch-glass” + “parrot’s beak) Wrists, feet, ankles enlarged. Clavicles much thickened.</td>
</tr>
<tr>
<td>Springthorpe</td>
<td>Male</td>
<td>21</td>
<td>Right Pleurisy with effusion at the base of the lung said to have been followed by Typhoid. Pusulent Pleurisy.</td>
<td>Terminal phalanges of fingers and also big toes markedly “clubbed” Lower ends of Radius + Ulna enlarged - also knees + ankles. Lengthening of long bones. Kyphosis.</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>51 years</td>
<td>High cheek bones. Teeth of lower jaw project slightly in front of upper. Tongue is somewhat enlarged. Absence of Thyroid.</td>
<td>Albumen at first found in urine but not in later examinations. Heart's dullness observed by emphysemata ling.</td>
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<tr>
<td>10½ years</td>
<td>3 months after pleurisy &amp; &quot;typhoid&quot; curvature of spine started. Ichthyotic condition of skin. Cardiac Disease (Systolic &amp; Diastolic murmurs). Muscular wasting.</td>
<td>No erotic excitation at any time. Penis small, like that of a boy of 10 years. Death a few days after admission.</td>
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<tr>
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<td>Sex</td>
<td>Age</td>
<td>Previous Illnesses</td>
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<tr>
<td>Bmaud</td>
<td>Male</td>
<td>35</td>
<td>Left eye injured with lacer (age 4½)</td>
<td>Impair especially the terminal phalanges hypertrophied - also toes with enlarpe &quot;watch glass&quot; &amp; &quot;parrot's beak&quot; nails.</td>
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<td></td>
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<td></td>
<td>Stabbed on the side with suppuration following</td>
<td>Base of nail raised.</td>
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<td></td>
<td></td>
<td></td>
<td>Purulent Pleurisy</td>
<td>+ nail striated.</td>
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<td></td>
<td></td>
<td></td>
<td>Operation + drain age</td>
<td>Radius ulna greatly enlarpe at lower ends, also the ankles.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Persistent Fistula</td>
<td>Knees enlarged.</td>
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<td></td>
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<td></td>
<td>Dorsal Kyphosis with.</td>
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<td></td>
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<td></td>
<td></td>
<td>Left Dorsal Scoliosis.</td>
</tr>
</tbody>
</table>

<p>| Davis       | Male | 4½ | Pneumonia (age 1) | First phalanges of fingers enlarped - 2nd normal. |
|             |     |    | Cough severe with | Terminal very enlarped. |
|             |     |    | copious purulent | &amp; curved nails like &quot;parrot's beak. |
|             |     |    | expectoration. | Toes - the same condition. |
|             |     |    | Left Pleurisy - | Wrists and ankles are |
|             |     |    | probably Purulent. | greatly hypertrophied. |
|             |     |    |                   | Knees enlarped (especially lower ends of femur) &amp; stiff. |</p>
<table>
<thead>
<tr>
<th>Age at Onset</th>
<th>Complications</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>34 years</td>
<td>Cannot touch the palm of hands with fingers nor can he dress himself or use knife for food.</td>
<td>Urine - reaction neutral Elements normal No Bacilli in the Sputum Operation performed (persistent fistula). But in spite of this the condition advanced.</td>
</tr>
<tr>
<td>9 or 10</td>
<td>Walking difficult - Pain in the knees.</td>
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<tr>
<td>months</td>
<td>Sleep interrupted by violent after the pains in the Right chest.</td>
<td>A liquid extract of healthy sheep's lung was used as a subcutaneous injection which apparently arrested the progress of the movements of various joints. Improved. Instalments lingering. Healed after the 28th injection.</td>
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<tr>
<td></td>
<td>Onset of Genital functions abolished.</td>
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<td></td>
<td>The forearms are semi-flexed &amp; pronates.</td>
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<td></td>
<td>Diminished height.</td>
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<td></td>
<td>Right side looks higher than left.</td>
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<td></td>
<td>Ear lobes &amp; lower lip slightly thickened.</td>
<td>(The result of this case has not yet been published).</td>
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<tr>
<td>2 years</td>
<td>Feverish just before</td>
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<tr>
<td>1 year</td>
<td>When expectorating</td>
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<td></td>
<td>Large quantities of purulent sputum.</td>
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<td></td>
<td>Mono - Very little pain in the joints.</td>
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<tr>
<td>Recorded by</td>
<td>Sex</td>
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<tr>
<td>Murray</td>
<td>Male</td>
<td>40</td>
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<tr>
<td>Thayer</td>
<td>Male</td>
<td>22</td>
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<tr>
<td>Thayer</td>
<td>Male</td>
<td>31</td>
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<td>Complications</td>
<td>Observations</td>
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</tr>
<tr>
<td>34 years</td>
<td>Dupuytren's Contract of Left Middle &amp; Right Ring Fingers</td>
<td>Mr. Jonathan Hutchinson saw this patient and thought him a case of osteo-arthropathy associated with Goit.</td>
</tr>
<tr>
<td></td>
<td>Nose slightly enlarged.</td>
<td></td>
</tr>
<tr>
<td>6 years after phthisis</td>
<td>Hyper-extension of the terminal phalanges. Pitting while a patient in the Hospital 21 years (7) Fluid &amp; Pain in Knee Joint Left Shoulder higher than Right.</td>
<td>Great quantities of expectoration. Sputum varied between 5 + 130 c.c. in 24 hours. On 3 days reached 400 c.c. Apparently slight but steady increase in size of hands &amp; lower ends of leg &amp; forearm bones.</td>
</tr>
<tr>
<td>30 years</td>
<td>While he had pitting 14½ years of pub after Had pains in the feet pneumonia appeared. Some fluid in the knees. No Tubercle Bacilli found.</td>
<td>First swelling noticed at the head of metacarpal bones. No Tubercle Bacilli found.</td>
</tr>
<tr>
<td>Recorded by</td>
<td>Sex</td>
<td>Age</td>
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</tr>
<tr>
<td>Thayer</td>
<td>Female</td>
<td>28</td>
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<tr>
<td></td>
<td>Male</td>
<td>34</td>
</tr>
<tr>
<td>Case I</td>
<td>Male</td>
<td>34</td>
</tr>
<tr>
<td>Case II</td>
<td>Male</td>
<td>38</td>
</tr>
<tr>
<td>Age at Onset</td>
<td>Complications</td>
<td>Observations</td>
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<tr>
<td>28 years</td>
<td>Nose rather broadened</td>
<td>Patient left Hospital at her own request. - Lungs almost clear.</td>
</tr>
<tr>
<td>9 weeks after</td>
<td>Pus-putrid expectoration</td>
<td></td>
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<tr>
<td>Compl.</td>
<td>Night sweats.</td>
<td></td>
</tr>
<tr>
<td>No Tubercle Bacilli</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 years</td>
<td>Muscular Atrophy (esp. Biceps)</td>
<td>Marked improvement in his general condition after 3½ months treatment in Hospital - and slight as regards bony enlargement.</td>
</tr>
<tr>
<td>Small or absent Thyroid</td>
<td>Movements of joints very much freer.</td>
<td></td>
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<tr>
<td>Hyper-extension of some of the terminal phalanges.</td>
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<td></td>
</tr>
<tr>
<td>Excessive perspiration especially in region of terminal phalanges.</td>
<td></td>
<td></td>
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<tr>
<td>Right Flexion of Elbows &amp; Knees.</td>
<td></td>
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<tr>
<td>Diminished stature.</td>
<td></td>
<td></td>
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<tr>
<td>Loss of Sexual desire &amp; Memory.</td>
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<tr>
<td>3½ years</td>
<td>Pain occurred in the joints before the clubfoot started. - Some effusion in the knees.</td>
<td>Five months later great improvement in general condition &amp; also as regards the hypertrophic. - Finger ends smaller - also wrists.</td>
</tr>
<tr>
<td></td>
<td>Slight loss of memory.</td>
<td>Nails grown up much flatter.</td>
</tr>
<tr>
<td></td>
<td>No loss of sexual desire.</td>
<td></td>
</tr>
</tbody>
</table>
In addition to these tabulated cases, Marfax has recorded 3 cases as occurring in children. In two of these the children were affected with supplicative conditions of the respiratory apparatus. The first:— an empyema, which was operated on & cured — the second:— bronchial dilatation.

The third case occurred in a girl attacked with lycetitis— with Right Pyelo nephritis following the use of the catheter during typhoid fever. M.T. Achard & Roux discovered the Bacterium Boli in the urine.

The child was relieved of this condition but has had several relapses.

There were no alterations in the Respiratory or Circulatory Systems.

The malformations of the fingers were very characteristic ("drum-stick") and the nails were markedly curved.

Traenitzel in the description of his case says that a daughter aged 11 has large extremities & gives a plate which shows increase in the size of the hands, wrists & feet.
To, therefore, report the results of an examination of the urine made in a case of osteo-arthropathy. The enlargements in this case had apparently started during infancy and were still present at the time of the examination — age 25.

Altogether — with Posmanin's case which I have, so far, been unable to obtain — and with the two cases I record this brings the total number of cases up to 61.
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