1897

Some notes on cases treated in Ward XXVI of the Royal Infirmary during winter session 1896-97 presented in competition for the "Wightman Prize in Clinical Medicine" By C. E. Bashford.

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Two cases exhibiting some features characteristic of a polyarthritis consequent on a septicaemia associated with gonorrhoeal urethritis – so called "gonorrhoeal rheumatism".

Case I. James Dolan (28) a labourer and professional foot ball player was admitted on Jan. 22nd 1897, complaining of pains and swelling in some of the larger joints which had then lasted ten weeks. Symptoms such as he complained of were first noticed by him in his right ankle towards the end of Nov. 1896, four weeks after the appearance of a purulent urethral discharge and one week after he had ceased to notice any gleety discharge. During the six weeks subsequent to the onset similar painful conditions developed in the following joints in order:– right hip, left hip, right shoulder, right sterno-clavicular, left shoulder and left knee in which the pains attained the maximum severity. He also suffered from stiffness and some pain in the lumbar and cervical regions of the spine. In all the joints the pain had been of a "dull dead" character very acute, continuous i.e. not varying in intensity nor shooting about when present in any joint. The pain was aggravated by pressure and by movement.

When admitted the skin over the malar bones was flushed; the flushed area was very sharply defined from the general pallor of the rest of the face. The right ankle and knee were somewhat swollen and painful. The other joints which had been affected were only slightly painful, stiff, and showed no evidence of thickening of the synovial membrane. When questioned he at once admitted gonorrhoea and forthwith he was treated with zinc sulphate injections. Subsequently pain and swelling reappeared in the right knee and right shoulder but on Feb 2nd he was free from all symptoms. On Feb. 4th there was a renewal of the urethral discharge together with a recurrence of the former condition in the left knee, right shoulder and spine. During this exacerbation he was treated with injections of zinc sulphate, and internally Oleum Copaibae, and ammoniated tincture of Guaiac in combination with Potassium Iodide were administered. The discharge disappeared in a little over a week and the joint conditions gradually subsided again. The seat of maximum severity flitted about during this exacerbation at one time being in the right knee at another in the left or again in the right shoulder till the discharge had finally ceased on Feb. 14th. After this date the improvement was rapid but with

occasional slight exacerbations of pain in one or other of the joints. Pain has altogether disappeared on Feb. 28th and on March 4th he was discharged with only slight stiffness in his lower extremities.

Case II. James Johnstone (17) a waiter was admitted on Jan. 27th 1897. He has acquired gonorrhoea almost two years before. The urethritis has remained untreated and during this time he has noticed a discharge off and on. The last occasion on which he noticed any discharge was about a month before the onset of the joint-affection. Three weeks before admission he was seized with acute pain in the left hip joint at the same time he was also feverish and sweated considerably. Three days later pain came on in knee and ankle of the same limb. He did not notice any swelling but the affected joints were very tender to pressure. The condition was supposed to be rheumatic and unavailingly treated with salicylates outside Hospital.

When examined his face was thin, pinched looking, and his cheeks very much flushed but the flushed area sharply marked off from the pale skin. The left ankle was slightly painful tender and movement performed with difficulty. The left knee was kept in a partially flexed position, the joint contained a small amount of fluid and was tender. The left hip was somewhat swollen tender and moved with difficulty. As in the case of Dolan the seat of the greatest severity of the condition did not remain stationary but flitted about. In turn each of the three joints would be the most painful and one or both of the others merely stiff or only slightly painful on movement. In this case the condition of the left hip became much more acute than has been the case in any of the joints of Dolan. On Feb. 28th the hip was very severely painful throbbing, considerably swollen but there was no redness; fluctuation could be made out and the temperature which had been going up for a few days was 104°. The knee and ankle at this time were practically free from pain. The condition of the hip did not improve; the pain became less intense but the joint much more swollen and fluctuation very well marked. The condition ultimately became such that he was removed to Professor Annandale's wards for surgical treatment on March 23rd. The treatment adopted was directed

to the cure of the gonorrhoea. At first injections of zinc sulphate and latterly of corrosive sublimate were administered. Internally the same substances were given as in the former case with the addition of.
Salicylate was administered in large doses during the whole time he was in the ward without any appreciable benefit.

Both patients are young men whose family and personal history presents nothing of note beyond what is directly related to their present condition. In each gonorrhoea having been acquired was neglected and in one of them allowed to develop into a very chronic gleet. In the case of Dolan the arthritic conditions developed as an acute attack of gonorrhoeal urethritis subsided; in Johnstone on the other hand the urethritis had been of a very chronic nature. Outside the hospital both cases had been ineffectually treated with salicylates.

The diagnosis of arthritis consequent on gonorrhoeal infection was suggested by the sharp limitation of the flushed areas on the faces of both patients. On interrogation Dolan at once confessed to gonorrhoea, but in Johnstone's case it was not till the condition had failed to yield to salicylates and the diagnosis thus justified that a history of venereal disease was drawn from him. This difficulty in obtaining a history of gonorrhoeal infection might be encountered under circumstances where leading questions are impossible. In such a juncture the failure of salicylates would have to be relied on as diagnostic the presence of gonorrhoeal urethritis or vaginitis assumed and treatment adopted accordingly. Possibly absorption of the products of other septic processes having their seat in the mucous membrane of the genito-urinary tract may give rise to similar joint conditions.

In both Dolan and Johnstone the condition was limited to the larger joints — in Dolan only the hypr ankle the elbows and wrists escaped: but further in Dolan the intervertebral, the occipito-atlantoid and the sterno-clavicular joints were affected.

As regards the diagnosis gout was out of the question from the localisation, age and history of the patients, the mode of onset and the absence of any gastric or other characteristic symptoms. The temperature, absence of perspiration, the presence of very defined areas of flushing on the face, the absence of redness over the

joints affected and the involvement of the vertebral, occipito-atlantoid and the sterno-clavicular joints were against acute rheumatism. As soon as proof of the existence of gonorrhoea was obtained the diagnosis was no longer doubtful.

In Dolan the temperature remained slightly above normal throughout varying between 98° and 100°. In Johnstone however the range of temperature has been higher, rarely falling below 99° between which and 102° it has remained pretty constant but on one occasion 104° was reached and 103° on two other occasions. In Dolan the maximum temperature was 100·2° and was only attained on two occasions. The higher range of temperature in the case of Johnstone appeared to be due to suppurative changes in the hip joint.

The pulse in Dolan varied from 60 to 110 per minute, in Johnstone the rapidity was greater being from 90 to 120.

Blood estimations were not made in the case of Dolan until his arthritic conditions had been acted. In Johnstone however the examination of the blood showed some degree of anaemia the estimation being Sp. Gr. 1056. Hb. 40%. R.B.C. 3,600,000, W.B.C. 3,000. B.P. 230,000. Altogether he was more poorly nourished than Dolan. He was younger the gonorrhoea had in his case lasted longer and he had evidently much less power of resistance to the lowering effects of disease.

The treatment pursued was merely that of curing the gonorrhoea and relying on the disappearance of the joint conditions as soon as that was accomplished. The means adopted were the usual local and internal antiseptic remedies. In Dolan this treatment was entirely successful but in the case of Johnstone not so satisfactory: the hip joint proving very troublesome so that ultimately surgical interference was deemed advisable.

In both cases the extraordinary obstinacy of the condition was well illustrated as was also the tendency to relapse, both characteristics being more pronounced in the case of Johnstone who had been subjected to a more prolonged influence of the gonococcus and who was in a less robust state of body. In both cases also, a marked feature of the arthritis was the manner in which the seat of the most acute pain would flit about from one of the affected joints to the other: one joint would be very painful with the accompanying swelling etc and the others merely stiff or painful only on movement.

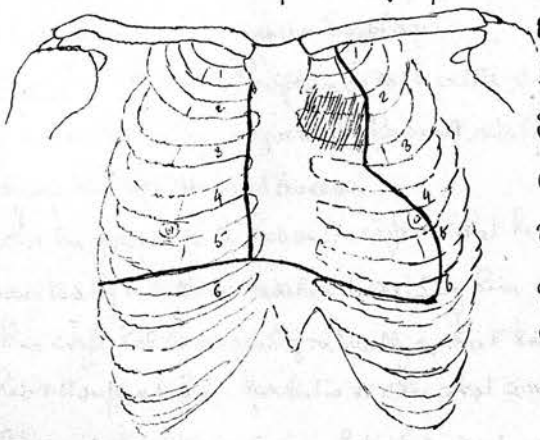
In neither case could the gonococcus be demonstrated in the urethral discharge and the fluid in the joints was not examined.

Three cases of mediastinal tumour – two of aneurism, one of solid tumour.

Case 1. Thomas Neill (43) a baker was admitted on Dec. 14th 1896. His family history presented nothing bearing on his illness. Personally he had been a very steady man abstemious in regard to alcohol and tobacco. There was no history or evidence of syphilis. His work called for a good deal of exertion such as that necessary to carry sacks of flour weighing two and a half hundredweights for a considerable distance and not infrequently upstairs. The making of dough he said "told very severely on his chest."

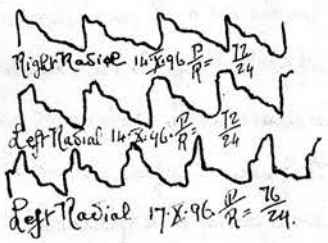
Nine months ago he began to experience at irregular intervals sharp stinging pains shooting down the left arm, from the axillary region to the elbow, and also but more frequently a sharp gnawing pain in the thorax. The pain in the thorax was limited to a small area just above and internal to the left nipple. These pains persisted for six months were worse on exertion, absent when resting, and never disturbed his sleep. During the same time he suffered from dyspnoea and palpitation on climbing stairs and on one occasion he fainted after having carried a sack of flour. Three months ago the pains became aggravated and persistent during such time as he was at work; they were also not infrequently present while at rest. He had to give up his work at this time. Since he gave up work the pain has gradually lessened and ultimately disappeared on the fifth day after admission.

On examination the praecordia showed a distinct bulging, which was also pulsatile, and situated immediately to the left of the sternum over the region of the second and third costal cartilages – the area being two and a half inches in diameter. Pulsation was also visible in the epigastric and suprasternal regions. There was an exaggeration of the pulsation normally present over the right carotid artery. The apex beat was palpable over an area one inch in diameter in the left sixth interspace and in the



mammary line. The impact was definite & resisting & there was no thrill. Over the prominence in the precordia the pulsation palpable was recognisably more forcible than that at the apex; it was expansile in nature and accompanied by a systolic thrill of a soft purring character. The area of cardiac dulness was enlarged downwards and outwards, the left border being three quarters of an inch external to the nipple and the apex in the sixth space four and a quarter inches from the mid-sternal line. Over all the valvular areas a harsh blowing systolic murmur followed by a weak second sound was audible. This murmur was also audible all over the chest in front and behind and so loud as almost to obscure the breath sounds. The same systolic murmur was also heard in the carotids and femoral artery but not in the radial artery. The area of maximum intensity of the murmur was over the prominence in the praecordial region.

The pulse in the right radial was unaffected, regular in time and character, expansion moderate, height quickly attained, no delay at the summit, fall rapid, moderately compressible and tension medium. On the left side the actual expansion was the same but there was a distinct delay in the attainment of the maximum expansion. The vessel walls were not thickened.



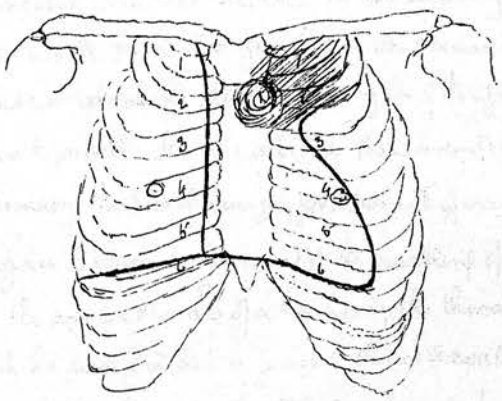
The respiratory alimentary and other systems were quite healthy. There was no dyspnoea resulting from pressure on the trachea, bronchi or left recurrent laryngeal nerve. No change in the voice had been observed. There were no abnormal breath sounds such as would arise from pressure on a bronchus. The sympathetic innervation of the pupil was not interfered with. There was no dysphagia.

Case II. Richard Shrigley (38) a cattle-breeder was admitted on Aug. 28th 1896. His family history was good. He had not indulged excessively in alcohol and denied having had any venereal disease.

For ten years or so he had suffered from what he described as a brassy cough which was excited by a tickling sensation located by him at the level of the cricoid cartilage. This cough had developed gradually without known reason. He never had any sputum, had not suffered from bronchitis or other chest complaint. The cough was not aggravated by varying climatic conditions but independent of these. Lying on the back was the only circumstance that had attracted his attention as tending to make the cough worse.

In Sept. 1895 while in Queensland, Australia, he began to suffer from a shooting pain across the upper part of the thorax. This pain was absent when at rest but brought on by movement such as rising from a chair stooping or manual labour of any kind. When present the pain was of a steady sharply stinging nature. He had previous to Sept. 1895 suffered occasionally from difficulty in breathing but never from palpitation or pain. About six weeks after the onset of the pain acting on advice he rested from work for a fortnight and during that time he noticed a swelling appear towards the upper part of the sternum: in about a week this had increased to quite a marked projection. As the swelling rose the pain gradually lessened and ultimately disappeared; the cough however still remained.

Inspection of the praecordia showed a rounded swelling two inches in diameter below and to the left of the supra sternal notch. This swelling extended over the manubrium to the second space and cartilage of the left side. The praecordia bulged over the fourth space for four inches from the middle line. There was faint pulsation over the projecting parts of the praecordia. The maximum of the cardiac impulse was felt in the fourth left interspace three and a half inches from the mid-sternal line. It was faint and not accompanied by any thrill. Palpation of the swelling over the manubrium showed this to be markedly expansile: there was no thrill here, but there was a distinct shock with the second sound. The swelling also had a feeling of fluctuation. There was a dull area in the left infraclavicular region extending over the first rib and space and also over the inner ends of the second rib and space and becoming continuous with the dulness over the prominence. The right border of the heart was one inch from the mid-sternal line, the left border just outside the nipple and four and a quarter inches from the mid-line of the sternum. The first sound in the aortic area was replaced by a soft purring murmur which was propagated to the inner end of the clavicle but no further. The second sound was accentuated and thumping. Over the swelling



there was a systolic murmur – it was faint. The second sound was accentuated. In the other areas there was nothing abnormal. The pulse in both right and left radial arteries was devoid of any noteworthy characteristic. There was some thickening of the vessel walls. The other systems were quite healthy.

Case III Thomas Hitchcock (36) an iron moulder was admitted March 2nd 1897. His family history was good. Regarding himself there was a history of alcoholism and a very definite history of syphilis. Seventeen years ago he had a chancre which was followed by loss of hair and a sore throat: when he married nine years ago his wife had a miscarriage – the three subsequent children have been healthy. From Feb. 19th to May 11th 1896 he was treated in Ward XXVI for intra-thoracic tumour.

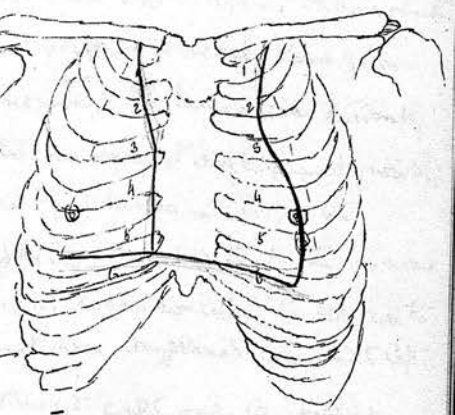
Eighteen months ago he experienced a sudden pain in the region of the left nipple. On account of illness connected with his stomach he was away from work for a time; when he restarted work he had to give it up on account of a cough caused by a tickling sensation which he felt in the region of the episternal fossa. About this time his face began to swell. For the condition then existing he was treated in the West Riding Infirmary Middlesborough, for a period of seven weeks. On resuming work he had again to cease on account of the swelling of his face and arms. He had then also the sensation as of a lump in the throat pressing on the gullet and over which he felt food had to pass in the act of swallowing. The act of swallowing caused pain of a gnawing character located along the right border of the sternum and sometimes shooting through to the back. When bending forwards e.g. to lace his boots he felt a sensation like being gripped by the throat and at the same time his face became flushed and swollen. If he lay on his right side he had pain of the same kind as that experienced during swallowing. These symptoms got worse and he was treated in Ward XXVI from Feb. 19th to May 29th 1896. His condition steadily improved under potassium iodide. The swelling of face disappeared in a week and the pain and difficulty in swallowing more slowly. He was discharged on May 29th free from any symptoms of intra-thoracic pressure. Since that time he had no recurrence of the condition till a week before readmission. On morning on wakening he had a pain in right side just below the nipple. The pain passed through to the back and was increased if he lay on his left side. For a week

or two previous to that morning he had noticed that the superficial veins in the upper part of his body were unduly prominent. When readmitted on March 2nd 1897, he was free from pain but there still remained the distension of the veins. He had no subjective circulatory symptoms. His face was somewhat cyanosed. The superficial veins of front of chest, sides of neck, and upper extremities were markedly distended. In those at root of neck the blood was flowing backwards in those of front of chest downwards.

There was no dropsy of the trunk nor was there any cyanosis beyond that of face and arms. The pulse on both sides was similar and devoid of significance. The vessel walls were somewhat thickened.

On inspection of the praecordia was negative. The apex beat was visible as a slight diffuse pulsation below and internal to the nipple and felt as a faint tap situated in the fifth space, the maximum being half an inch internal to the nipple. There was a very slight heaving - less than that of apex - over the dull area in upper part of thorax; there was no pulsation elsewhere.

The upper border of the heart could not be percussed because of a dull area extending from below clavicles on either side of middle line for a distance of two inches. The right border of the heart was at the margin of the sternum, the left passed through the nipple and the apex was just in the ~~sixth~~ fifth space in the nipple line. In the aortic area the first sound was weak and entirely replaced by a faint soft bruit. The second sound was reduplicated and relatively accentuated. This bruit was not propagated into the neck. There were no signs of stenosis in the pulse. In the pulmonary area the first sound was weak the second relatively louder. The sounds in the mitral and the tricuspid areas were weak but pure.



[Tracing taken after treatment for one week.]

Beyond some slight dilatation of the left pupil there was nothing abnormal in the other systems.

In the first case the physical signs viz the fullness position and expansile nature of the tumour, the delay in the attainment of the maximum expansion of the in the Left radial artery, the loud systolic bruit, the greater force of the impulse palpable over the tumour compared with that at apex, and the purring thrill all pointed to aneurism of the transverse portion of the arch of the aorta. In this patient possibility the result of muscular over-exertion. In a mediastinal tumour of the size which was here present and especially in a case of aneurism of the transverse portion of the arch the entire absence of pressure symptoms other than the anginous pain was noteworthy. There was no dyspnoea, no dysphagia, no involvement of the sympathetic nor of the Left recurrent laryngeal nerve.

In the second case the physical signs of aneurism were in some respects even more marked. The tumour had eroded the sternum and came to the front of the chest so that fluctuation could be detected within it. There was also a distinct shock with the second sound. The cough was not the result of pressure on the Left recurrent laryngeal nerve for the vocal cords were healthy: it appeared to be due to pressure on the trachea.

In the third case the only indications pointing to aneurism were the position of the dull area and the faint systolic heard over it. But the bruit was not propagated. The impulse palpable over the tumour was fainter than that of apex. An aneurism of size sufficient to press on superior vena cava and occlude it would have given much more definite evidence that it was an aneurism. The tumour was evidently solid and the long period during which it had existed was against malignant growth. The readiness with which the condition was relieved by potassium iodide in conjunction with the very definite history of syphilis indicated that the tumour was syphilitic in nature and its position that it was developed in relation to the mediastinal glands. In all three cases the heart was displaced downand to Left.

In the first case and second case the treatment could only be palliative and consisted mainly of rest in bed, combined with low diet and potassium iodide. The rest very soon had the effect of alleviating the pain and distress. In the third case the special value of potassium iodide as a curative and diagnostic agent was well brought out.

The prognosis in the first two cases was not immediately unfavourable but ultimately was certainly so especially in the case of Thrieplaud. In Hutchinson's case the ease with which the condition was relieved by the administration of Potassium Iodide made the prognosis altogether favourable.

The combination of aortic incompetence with aneurysm

A case of spastic paraplegia secondary to caries of the spine.

Henry Barron a groom not quite eighteen years of age was admitted on Jan. 12th 1897. As far as could be ascertained his family history was good. His father and mother were both alive and well. He was the eldest of a family of fifteen, twelve of whom were alive and healthy. Three died in infancy from causes unknown, an infant brother suffers from "Knock-knee". The configuration of his face was pronouncedly that of the strumous diathesis. No relative had suffered from spinal disease nor was he aware of any tendency to chest troubles. In childhood he suffered from measles and scarlet fever. At the age of ten he fractured the left femur. He was a teetotaler. There was no reason to suspect syphilis.

When fourteen years old as a message boy he had to carry heavy loads, using his right arm and shoulder for the purpose. While so employed his mother and others at home noticed the gradual appearance of a projection in the right interscapular region. This was in 1894. He first observed abnormal subjective sensations more than twelve months after he was aware of the spinal condition, when towards the end of 1895 he began to have occasional sharp pains and a feeling of weakness in that region of the back; he only suffered in this way when making special or prolonged exertions with the arms. Towards the end of February or the beginning of March 1896, i.e. some three months after the pains appeared in the affected region of the spine, he noticed that there was a slight stiffness and at times a feeling of numbness in the left leg. These sensations were at first irregular in nature being present or absent at different times. Increasing insidiously these sensory phenomena became more and more evident and continuous. When definitely established, together with tingling sensations which subsequently appeared especially in the toes, these sensory phenomena were always worse in the morning and at other times when he moved his limbs after a period of rest. He had no sensations of heat or cold, no pain in the limb and as yet there were no signs of any loss of co-ordination.

Before the end of the month he was aware of slight jerkings and tremors whenever he made a voluntary movement of the limb. Later his toes began to catch the ground and he stumbled a good deal in consequence. The condition progressed to trailing to trailing the limb along the ground, when going upstairs having to do so with the right leg and drag the leg after, and in mounting a horse he was

unable to lift the right leg into the stirrup.

In April he noticed that the right leg was stiff and less readily moved after he had retained it in one position for any length of time; it was also stiff in the morning. A month later the condition had progressed so rapidly that both limbs were equally affected. Within two or three weeks from the appearance of the stiffness in the right leg he was unable to walk any distance in consequence of the knees knocking together and because the dominant leg in being brought forward was jerked forwards and inwards so as to cross the other leg and trip him up.

Almost from the appearance of the paraesthesia in the right leg he had been aware of jerkings and tremors in that limb, similar conditions developed in the right leg and when both limbs were equally affected the jerkings and tremors had become more frequent. These irregular tremors and jerkings were present when the limbs were at rest and due to no apparent cause. They were very markedly exaggerated by any effort at voluntary movement. Barron continued at his work which consisted mainly of driving till the end of June at which time he was no longer able to climb into the conveyance which he drove.

In June he noticed that he was able to sit, without any cognisance of the fact, in water so hot that ~~that~~ he was unable to retain his hands in it.

After leaving his work he took to bed and for a week or so he was able to get up and with assistance capable of making some attempts to cross the room; but if in attempting to walk his knees became flexed he at once fell, he had no control over his knees and only attempted to walk by placing the thighs on the pelvis. After the first week or so the rigidity of the limbs became such that he was no longer able to make any attempt at walking, and any attempt to get out of bed ~~set up~~ set up painful spasmodic coarse jerkings in the limbs. He said that his limbs were at times so rigid that his father's utmost effort was insufficient to flex the knee, at other times passive flexion of the knee was readily made, but he himself could not voluntarily do so.

Some weeks later the limbs which Richards had retained the normal posture assumed a crossed relation the left being placed over the right. The spasmodic jerkings had also increased in frequency and were elicited by slighter causes and communicated from one limb to the other. The tingling sensations in

the toes grew less marked. There was pain and discomfort at the point of pressure where the legs crossed. A sensation of constriction was present in the upper abdominal and lower thoracic regions between the xiphisternum and the umbilicus.

With the advancement of the spinal impairment some difficulty in micturition occurred. At times it was difficult to start the stream and at other times whilst conscious of the desire to micturate there was inability to retain the urine during the time that suitable preparation was being made so that on these occasions there was incontinence. His bowels had been constipated, Unconscious defaecation had occurred but not often.

When admitted examination of the thorax showed it to be somewhat elongated narrow and with the left costal cartilages somewhat more prominent than the right. There was lateral curvature of the spine — the second to the sixth dorsal spines being deviated to the right so as to lie quite close to the vertebral border of the scapula. In the right intrascapular region there was therefore a marked rounded prominence. The lumbar concavity was absent.

The lower limbs were entirely beyond volitional control. They were in the condition above described. The muscles of the anterior abdominal wall were rigidly contracted and hard on palpation. Micturition and defaecation both occurred unconsciously.

Pain was only felt at the site of pressure between the crossed limbs. There was no paraesthesia. Sensibility to touch, to heat and cold, and to pain was very greatly impaired as far up the trunk as the level of the xiphisternum. On the left side sensibility to touch was more nearly absolutely abolished than on the right side. Up to the same level there was bilateral impairment of pain; the prick of a pin was only appreciated as touch in many places and elsewhere appreciation of the irritation was diminished or delayed. Sensibility to heat and cold was similarly affected sometimes regarded as touch and sometimes confused. Tickling was not recognised. The sensibilities of the trunk above the level of the ensiform and of the upper limbs were quite healthy.

The plantar reflex was present. The cremasteric reflex was present and irritation of the skin of the inguinal and suprapubic regions produced partial erection of the penis. The abdominal and the epigastric reflexes could not be elicited.

The knee jerk was increased on both sides. There was bilateral ankle-clonus — the tremor of one limb was communicated to the other.

Patellar clonus was not obtained. Voluntary motion of the lower limbs was impossible. The electrical reactions of the muscles could not be satisfactorily tested because the weakest current set up rhythmical tremors and the rigidity of the muscles rendered the results fallacious. The muscles were not wasted.

A hot sponge applied over the spine was felt as heat above the deformity but only as touch below it; the application did not cause any pain. The spine was not tender on percussion.

The eyes showed no departure from health; there was no nystagmus. The circulatory system was healthy. The respiratory system was only affected as regards the distortion of the thoracic wall.

This case of spastic paraplegia secondary to disease of the vertebrae was very interesting from the nature of the onset course and the symptoms manifested. The sensory and motor disturbances were very definite in their character and enabled one to determine the localisation of the lesion with tolerable certainty.

The bone disease was definitely first in its incidence, and had existed for over a year before the effects of its presence began to manifest themselves, in the progressive impairment of the spinal cord functions. The chain of phenomena from the first appearance of paraesthesia to the complete cutting off of all cortical control over the lower half of the body were consequent on slow compression of the cord. The clear antecedence of the caries of the middle dorsal vertebrae justified its being considered as the primary factor in the compression which subsequently resulted from the pressure exercised by the accumulation of carious products or by thickening of the dura.

As regards the nervous phenomena proper, apart from the spinal curvature these were of a nature which afforded, at least as far as the upward extent of the lesion was concerned, very definite information.

The cord was impaired in its conductivity and in its central functions. The conducting functions were impaired in an extreme degree both in regards to efferent and afferent impulses. The central functions were in a state of abnormal excitability.

The muscles were not cut off from the cord by any peripheral lesion, nor by any imperfection of the lower neurone within the cord. The impairment was

central to the anterior cornual cells for the non-involvement in the bulk of the muscles necessitated the preservation of these cells, and the perfection of the reflex arc, i.e. of the posterior nerve roots with their reflex motor collaterals, the anterior cornual cells and anterior nerve roots, was equally necessary from the persistence of the myostatic irritability. For the same reasons myelitis - inflammation of the cord itself - was excluded from being the pathological basis of the condition. Myelitis would have required involvement of the anterior cornual cells with atrophy and flaccidity of the muscles. The only lesion which would account for the muscular conditions was one of the cortical neurons by which the conduction from the higher motor controlling centres was abolished.

The impairment of sensibility to heat touch and pain was extreme as high up as the zone just below umbilicus i.e up to the region supplied partly by the ninth and partly by the seventh dorsal segments. On the left side the sensibility to irritation was practically abolished. The interruption of the posterior columns did not extend above the level of the ninth dorsal segment.

The reflex mechanisms of the bladder and rectum showed gradual impairment of the volitional element normally present. At first while conscious of the desire to micturate he had difficulty in accomplishing the act i.e. there was inability not to restrain but to excite the action of the centres. This condition giving support to the idea that micturition centre consists of two parts a part exciting contraction of the sphincter and a part exciting contraction of the detrusor, and that coordinated acting of these is necessary for the perfect performance of micturition. The coordination was upset by the cutting off of the cortical volitional element in micturition; the sensory fibres conveying the upward message of "micturate" persisted in this case to act for a longer time than did the fibres bearing the down coming motor impulse. When first seen his urine was passed unconsciously, not in a constant dribble but only after a certain quantity had accumulated in the bladder. The bladder was not distended so that the bladder was functioning in purely reflex way, expulsion of urine taking place as soon as the sensory impulse was of sufficient strength to set the motor cells off. A similar condition pertained in regard to the rectum the sphincter ani was not relaxed but exerted distinct pressure on the finger when inserted into the anus. The function had lost the volitional element and became

an automatic purely reflex one.

The muscular phenomena afforded some evidence of the downward extent of the lesion. The muscles reflexes depending on the integrity of the cord as high as the second lumbar segment were unimpaired; but there was in addition no impairment of the sexual reflex functions of the segments of the cord of the same level. The epigastric and the abdominal reflexes could not be elicited. These reflexes are related to the regions of the cord corresponding respectively to the extent of the fourth to the seventh Dorsal segments, and the seventh to the eleventh Dorsal segments. In addition the girdle sensation around the upper abdominal region, the tonically contracted almost board like state of the abdominal muscles and the absence of wasting of the muscles of the abdominal wall indicated that the posterior and not the anterior nerve root connections were responsible for the non-reactability of the muscles of the anterior abdominal wall. The condition of the abdominal muscles made the determination of the downward extent of lesion doubtful. The sensory phenomena showed definitely that the upward extent was not higher if as high as the sixth dorsal segment. In downward extent the cord was certainly involved above the level of the second lumbar segment.

As regards life the prognosis was not unfavourable so long as the Bladder remained free from cystitis and unless some inflammatory condition of the cord caused rapid upward extension of the lesion. The slow onset of the condition and its very chronic nature made hope of recovery impossible. The only chance of recovery lay in an attempt to remove the supposed pressure by surgical interference. Mr Chinery operated but failed to alleviate the condition. No particular note of the condition of the cord in the Dorsal region below the level of the sixth vertebra seems to have been made, at any rate what the exact conditions revealed by the Operation were cannot be ascertained.

A case of lesion of the aortic valves complicated by the presence of aneurism of the innominate, right common carotid and left subclavian arteries.

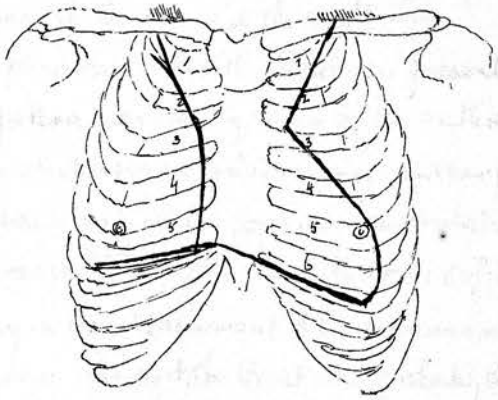
Peter Cannon (56) Labourer was admitted on Nov. 11th 1896. He knew nothing of his family history. He had greatly exceeded in regard to alcohol, having indulged freely in "neat" spirits; he had been much exposed to inclement weather and bad sanitary conditions. On account of the irregular nature of his employment he had at times been subjected to unwonted muscular exertions. His health he described as having always been good. He had not suffered from rheumatism, nor from any specific fever. Syphilitic infection was denied, but specific cicatrices on the sides of the tongue and the enlarged and hard condition of the palpable glands were evidence to the contrary.

For seven weeks before admission he had been unable to work on account of bronchitic and cardiac symptoms, which he attributed to colds resulting from excessive exposure. Coughing and exertion he said had caused dyspnoea and palpitation. He had also suffered from palpitation when lying on back, and from giddiness – but not faintness – on exertion. He had slept but little and that little had been disturbed by dreams. Headaches had also troubled him but otherwise he had been free from pain. His face had been swollen and especially there had been a puffiness under his eyes for some days before admission. He had also observed his face getting redder in colour. The above conditions persisted on admission. The fleshiness of the face was more marked on the left side. In addition to slight oedema of the face there was a little oedema behind the external malleoli.

There was an bulging of praecordia. The apex beat displaced down and out was visible two inches below and two inches to left of nipple, and felt as a diffuse heaving the maximum impulse in the fifth space half an inch below and one inch external to nipple. Very slight pulsation was visible in the second right space close to the sternum; the impulse felt here was more feeble than that at apex. The sternal end of right clavicle and the adjacent portion of the manubrium were displaced forward in the region of the sterno-clavicular articulation. On both sides of neck there was violent pulsation. On the right side above clavicle and appearing from behind inner head of sterno-mastoid an expansile globular tumour about one inch in diameter was palpable and the impulse felt was more forcible than that

at apex. On left side of neck above and parallel to the clavicle, behind outer portion of sterno-mastoid, and ascending a little further out there was visible a pulsation, which on palpation was expansile but the impulse was not more forcible than that at apex. The expansion was accompanied by a distinct systolic thrill. Pulsation was also evident behind angle of jaw and along the course of the facial arteries.

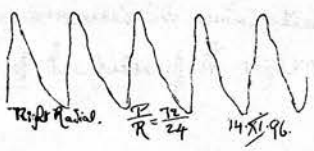
The heart considerably hypertrophied and dilated, as a whole was displaced somewhat downwards and to the left. The upper border was at the upper border of the third left costal cartilage, but not definite on the sternum because of an area of dulness in the upper sternal region. The right border was two inches from the mid-sternal line, and superiorly merged with a dulness ascending upwards to and then along upper border of second rib towards clavicle. The left border became continuous with a dull area ascending



over the region corresponding with the inner inch and a half of clavicle and the inner portions of the first and second ribs. The apex was one and three quarter inches external to, and two and a half inches below the nipple. The longest diameter of the cardiac dulness from left border to right border was nine inches.

A double aortic bruit was audible in the mitral area, the systolic portion being somewhat rough, the diastolic soft blowing and in length equal to the systolic. Nearer the sternum and also towards the base both sounds were more audible especially the diastolic which in these areas was also the longer of the two. The systolic bruit in the aortic area was very rough, it was also audible in the carotid femoral and axillary arteries. In the aortic area the diastolic bruit was soft and blowing: it was propagated with intensity to the lower end of the sternum. Both murmurs were distinctly audible in the second right interspace close to the sternum over the pulsating area there.

The pulse on palpation was typically that of aortic regurgitation, regular in time and in character, the expansion quickly attained and as quickly lost without delay at the summit. Sphygmographic tracings showed in the right radial pulse a delay in the upstroke which was absent on the left side.



On the right side of the neck the veins were evident beyond the normal but there was no distension; the smaller vessels in the clavicular and lower cervical region were somewhat distended. There was no such condition on the left side.

The other systems presented nothing of note beyond the presence of some emphysema and slight Bronchitis. The liver was very slightly if at all enlarged. Morning vomiting evidently alcoholic had occurred. There was no change in the voice, no abnormal condition of the pupils nor of deglutition; indeed there were no indications of pressure arising from the aneurismal conditions at the root of neck beyond the slight jugular prominence of the veins on the right side.

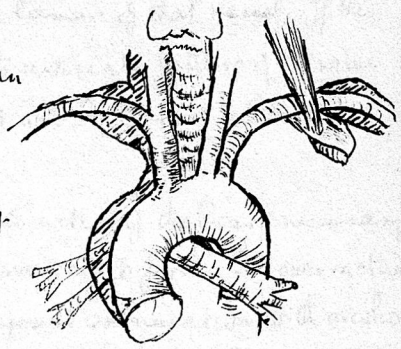
On account of the definite nature of the physical signs the diagnosis presented no difficulty. The presence of aortic incompetence was clearly shown by the nature of the pulse, the diastolic bruit, the headaches sleeplessness and dreams: capillary pulsation was also observed in the finger nails and on the forehead after irritation. That the harsh aortic systolic murmur was not due to stenosis of the aortic orifice was clearly proved by the absence of any delay in the attainment of the maximum expansion of the pulse in the left radial artery. The systolic bruit was probably the result of atheromatous roughening and some degree of dilatation of the aorta, the latter condition being indicated by the presence of the pulsation and dulness to the right of the sternum in the second space. The changes in the aorta and great vessels together with the cardiac hypertrophy and dilatation had led to some displacement of the heart downwards and outwards.

The globular tumour in the right carotid triangle because of its position and localised character, its protruding from below inner head of sterno-mastoid, its expansile nature, the systolic impulse which was greater than that felt at apex and the audibility of the aortic sounds was pendulously an aneurism in connection with the right common carotid at its origin, or slightly above its origin from the innominate artery. Considering the fact that innominate artery was also similarly affected the dilatation seemed probably situated at the origin.

The displacement forwards of the sternal end of clavicle and adjoining portion of the manubrium sterni on the right side, the dulness in that region and the fact that both aortic murmurs, especially the systolic, were audible indicated an aneurism of the innominate artery. The delay in the upstroke of the pulse of the right radial artery

also pointed to this condition and the extension of the dulness so far out, to the possible involvement of the subclavian artery also. The condition therefore appeared to be affecting all the great vessels on the right side.

The position of the localised expansile tumour above and parallel to clavicle, and extending from beneath clavicular head of sterno-mastoid for a little way, the presence of a distinct systolic thrill with the impulse, the presence of a loud systolic bruit, were sufficiently diagnostic of a like condition affecting the left subclavian artery in its third part.



The combination of aortic incompetence with these aneurismal conditions at the root of the neck is of interest as possibly demonstrating the progressive effects of increased internal strain on the cardio-vascular system when that system has been physiologically and functionally weakened by extensive sclerotic changes. Further the combined conditions emphasise the necessity for a proper caution in the use of cardiac tonics. in

That the incompetence of the aortic valve was antecedent to, and its direct consequence a material accident responsible for, the development of the aneurisms seems a justifiable conclusion from the following considerations. The patient had a definite history of syphilis at least he presented strong evidence of having suffered syphilitic infection, he had a definite history of alcoholism, his work called for excessive muscular exertion and unwonted strains, he had been much exposed to inclement weather all of which agencies are possible factors in the production of arterio-sclerosis as a general condition. Further at his age (56) degenerative changes in the arterial walls were to be expected — the walls of all the palpable arteries were thickened. There was no history of rheumatism, nor of any febrile condition likely to be followed by endocarditis, which would account for the lesion of the aortic valve. It seemed probable that the semi-lunar flaps had become incompetent either in consequence of contraction and curling due to the involvement of their tissues in the general arterio-sclerosis, or, that the segments having undergone some degree of fibrous change had given way under the abnormal arterial pressure resulting from the loss of the physiological elasticity of the artery walls. This abnormal arterial tension, consequent on the increased resistance to the outflow, and arising from the

thickened condition of the vessel walls generally, would be at its height in the aorta where the brunt of the strain would of necessity fall on the semilunar flaps and as a consequence these ultimately gave way. No doubt both of these possible factors were at work in this case so that the degenerative changes in the segments themselves and the abnormally high tension to which the segments were subjected alike played a part in the causation of the lesion. Further the interstitial changes in the aortic wall had lead to some dilatation of the lumen of that vessel. If this dilatation occurred early it would contribute to the ultimate failure of the valve by still more greatly increasing the pressure on it and by tending to dilate the aortic orifice.

With aortic regurgitation established that increased action of the heart necessary for the attainment of compensatory hypertrophy was called forth. The over-action of the heart was still further increased by the frequent stimulation with alcohol. The unwonted muscular strains to which by the irregular nature of his calling he was subjected required still greater efforts from the left ventricle, and through the muscular contraction simultaneously adding to the resistance to the outflow from the aorta the already abnormal tension in that vessel was raised yet higher.

Under all these various conditions involving increased pumping power by the heart a large volume of blood under abnormally high pressure was projected into the great vessels and these had been deprived of the healthy resiliency of their walls. Their walls were rigid and the pressure conditions were such as to still further augment the interstitial changes. The walls unable to recoil yielded little by little to the pressure within; this yielding ultimately resulting in the development of aneurismal dilatations in the positions most favourable.

The removal of the maximum degree of dilatation from the aorta itself is noteworthy and probably to be accounted for by the fact that the regurgitation acted as the protection of the aorta from the pressure within itself. For although the pressure during systole would be highest immediately above the aortic orifice yet at this point the pressure would also be of shortest duration; possibly also the long persistence of the atheromatous condition had lead to the deposition of calcareous protecting plates in the middle coat of the dilated aorta. The great vessels were less favourably situated as regards the relief afforded by regurgitation and in their case the constant factor of peripheral resistance was at its maximum. The part played by the resistance to outflow

appeared to be demonstrated to some extent by the greater degree of the condition on the right side where in a right handed man the blood pressure effects arising from muscular effort would be more potent than on the left side.

Thus while previous to the establishment of regurgitation the maximum intensity of the internal pressure was directed on to the semilunar flaps, i.e. to the point with least capacity for resistance and most capacity for compensation should breakdown occur; by the mere establishment of regurgitation the maximum intensity of that pressure was removed to the great vessels, and as it were distributed, but on account of the potency of the other concurrent factors the cardio-vascular system derived no benefit from the pressure being thus distributed and again at the seat of maximum intensity of pressure breakdown took place, this time in the form of aneurismal dilatation.

In uncomplicated aortic incompetence the call for increased work acts as a stimulus sufficient to call forth compensatory hypertrophy of the left ventricle and therefore contra-indicates the administration of cardiac tonics which would tend to produce hypertrophy beyond the needs and thereby render the cardiac nutrition difficult or deficient with consequent deterioration in the quality of the cardiac wall. In this case one only did these considerations weigh but the weakened condition of the vessel walls still further indicated the undesirability of yet more increasing an already dangerous intra-arterial pressure for any such increase would surely have been attended by aggravation of the aneurismal conditions.

The immediate prognosis was good unless some unforseen incident arose to cause rupture of aneurism or failure of heart. The ultimate prognosis was unfavourable. The conditions at the root of the mischief were beyond surgical interference.

The treatment adopted was rest light diet and potassium iodide, really only palliative treatment the condition being beyond cure which could only be effected by obliteration of the arteries involved, a contingency not likely to arise.