LECTURES

ON

CLINICAL MEDICINE

DELIVERED IN THE

GLASGOW ROYAL INFIRMARY

BY

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PREFACE.

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THE present volume contains a selection from the clinical lectures which it has been my duty to deliver in the Glasgow Royal Infirmary. While it cannot be claimed that the lectures record anything very new, it may be allowed that some of the cases described in them are of rare occurrence, especially those of Landry's paralysis, scleroderma with hemiatrophy, and osteo-arthropathy, and that others are of general clinical interest either from the point of view of diagnosis or of treatment.

All the lectures have already appeared in various periodicals, and I have to acknowledge my indebtedness to the editors of the *Glasgow Medical Journal;* to Messrs. J. B. Lippincott Company, of Philadelphia, publishers of *International Clinics;* and to the editor of the *Archives of Pediatrics* for their kind permission to reprint such of the lectures as have appeared in their respective journals. In this collected form the lectures may be of some interest and service to the students to whom they were delivered; and it is perhaps possible that these selections from the case-book of a physician, showing as they do the varied nature of the work in which he is engaged in the wards

of a large general hospital, may not be altogether unworthy of the attention of a wider circle of readers.

To my clinical assistants, Dr. Walter K. Hunter and Dr. T. K. Monro, the latter of whom has now been promoted to the office of physician to the Glasgow Royal Infirmary, I am under great obligation for much valuable help, as will frequently appear to the reader of the following pages; and I have also to express my thanks to my successive house physicians, whose enthusiasm and energy in the discharge of their duties have much lightened my labours.

Glasgow, *May, 1900.*

CONTENTS.

LECTURE IV.

LECTURE V.

LECTURE VI.

LECTURE VII.

LECTURE VIII.

A Case of So-called Hypertrophic Pulmonary Osteo-arthropathy of Marie, without Pulmonary Disease.

LECTURE IX.

Four Cases of Muscular Atrophy.

LECTURE X.

A Case of Scleroderma, leading to Pronounced Hemiatrophy of the Face, Body, and Extremities.

LECTURE XI.

Case of Cerebral Tumour—Glio-myxoma Cerebri.

LECTURE XII.

Spastic Paraplegia in a Boy, probably due to a Progressive Myopathy.

LECTURE XIII.

LECTURE XIV.

LECTURE XV.

APPENDIX.

CLINICAL MEDICINE.

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LECTURE I.

LANDRY'S PARALYSIS.[1]

During the first few days of the session, in the course of our ward visits I frequently directed your attention to the case of a patient in the female ward, suffering from a generalised form of paralysis presenting the features which are generally described as those characteristic of Landry's acute ascending paralysis, and I desire now to make the case the subject of a clinical lecture.

The patient, Mrs. M'C., aged 23 years, was admitted to Ward 8 on the 25th October, 1895, complaining of generalised paralysis of gradual onset from the legs upwards since the 15th.

I had seen her, in consultation with Dr. Burges of Crown Street, on the 21st, when the following facts as to the onset of the illness were obtained:—

On the 12th October, after feeling a little out of sorts for a day or two, she consulted Dr. Burges for what seemed to be a common cold, and for which the usual treatment was recommended. On the 14th, headache was the chief symptom complained of, and was relieved by phenacetin. She was able, however, to rise in the evening and prepare her husband's

[1] Delivered Thursday, 5th December, 1895.

supper. On the 15th, headache was still very severe, and in the afternoon with difficulty she had managed to get out of bed and open the door. With this exception she was in bed all day. On the 16th she experienced a stiffness in her legs, and in the course of the day they became completely paralysed. On the 18th the hands and arms were involved. On the 21st, when I saw her with Dr. Burges, it was noted that the arms and legs were almost completely paralysed, but that the eyelids, lips, tongue, head and neck and diaphragm were quite unaffected. Sensation tested in the lower limbs was absolutely normal. A few rose coloured spots were seen on the front of the abdomen. The bladder and bowels were quite normal; and, the patient being between four and five months pregnant, of her second child, the fœtal heart could be easily heard. It is also of importance to record that a careful enquiry into the habits of the patient as regards the use of alcohol was made, and the result was to show that she had always been strictly temperate.

The following is the clinical history as made out by my resident assistant, Mr. Arch. Young, B.Sc., M.B., after her admission to the ward:—

"She was uniformly healthy until the onset of her present illness. About a fortnight before her admission she says that she felt somewhat 'colded,' and experienced sensations which were then regarded by herself as premonitory to a severe cold of an influenza type, an opinion which Dr. Burges, who first saw her on the 12th inst., somewhat confirmed.

"Her legs and her back felt sore, and she complained of general malaise. After resting for a day and making use of ordinary domestic remedies, she felt somewhat better, but soon the tired, sore feeling in her legs returned, the headache became troublesome, and she experienced a great drowsiness, occasionally having difficulty in keeping awake. On the evening of Tuesday, 15th October, she found her legs becoming very weak, and had great difficulty in attempting to walk. Next morning she was quite unable to walk, and has not had the power of her legs since. It is difficult to obtain precise information as to the manner in which the paralysis

involved the lower limbs. On the second day after the onset of the paraplegia, the arms became involved, apparently the upper arms before the hands. No definite pains have been felt, but since the onset of the paralysis, the affected limbs have had a somewhat numb feeling, and at times distinct, and very unpleasant tingling has been remarked, which of late has been almost constant. So far, speech has not been affected. She states that she can swallow with the greatest ease, and she has no difficulty of respiration. Headache, which was very severe at the outset, has now quite passed off.

"She can give no cause for the onset of her illness, save that she may have got a chill while washing a few days before her first symptoms were experienced. The drowsy state at first present passed off with the onset of the paralysis, and since then, insomnia has been complained of. The special senses do not seem to have been at all involved, and she states that she has perfect control over both bladder and bowels. Her appetite has been fair, but vomiting occurred on one or two occasions before admission, due, she thinks, to medicine administered. Sweating had also been a pronounced feature of the case before coming in to hospital, and Dr. Burges was of opinion that this might have been originally due to phenacetin administered for the relief of the headache.

"At the time of her admission the patient was in an utterly helpless condition. The cheeks were flushed, but rather hollow, and the pupils were widely dilated, becoming in a short time rather less so. The lips were dry, and the gums and teeth covered with sordes. The surface of the tongue was dry and caked, and the breath had a very unpleasant odour. The skin was hot, and the whole surface of the body was bathed in an ill-smelling perspiration. The arms and hands were kept lying in one position, and could not be moved by the patient herself to the very slightest extent, except for a very limited movement of the terminal phalanges. The fingers of both hands were kept more or less persistently in a semi-flexed state, and on forcible extension of the fingers, they simply returned to this condition, apparently by their own elasticity. The lower limbs were also quite immobile so

far as any voluntary effort was concerned. All the reflexes, superficial and deep, of the upper and lower limbs, and of the surface of the abdomen, seemed to be quite abolished, and no clonus could be developed. Sensation generally was quite uninpaired, the only sensory phenomena noted being the tingling previously described, which was most pronounced on the inner aspect of the knees and in the upper arms, and which caused so much discomfort as to lead the patient to frequently demand a change of position. At times, too, a pain of a darting kind was complained of as passing down both arms.

"The pulse was rapid, numbering 132 per minute, but no abnormality was detected in the condition of the heart, the lungs, or the liver. The urine presented the following characters:—Colour, normal; reaction, acid; specific gravity, 1,026; albumen, a slight trace; sugar and blood, absent; abundant flocculent deposit.

"The uterus could be made out by palpation reaching almost to the umbilicus, and the sounds of the fœtal heart could be distinctly heard.

"During the first night of residence she was extremely restless, constantly desiring a change of position, crying out for something to drink, or asking for one or other of the limbs to be rubbed on account of the tingling. The pulse maintained its rapid character, and was of very low tension."

On the day after her admission, a careful examination of the blood was undertaken at my request by Mr. Walter K. Hunter, B.Sc., M.B., who has had much experience in such investigations. He reports a slight excess in the number of leucocytes, with Brownian movements visible in the granules of some of them; in some of the white blood corpuscles, also, a few black granules could be distinctly observed. The red corpuscles he found to be normal.

On the 26th October, 1895, I made out that there was very slight power in the left hand, so that she could close her fingers on my hand very lightly. The right hand was powerless, but Dr. Burges, who happened to be present on this occasion, reported that when I saw her with him on the

21st October, the right hand was then much in the same state as I now found the left hand to be. The plantar reflexes were quite abolished, but she felt tickling of the soles quite well, though she could not draw away the feet. Sensation of touch, pain, and temperature—the latter being investigated by test-tubes filled with hot and cold water—we found to be normal in every part of the body. Perspiration was abundantly present, and had been so all night. There was absolutely no tendency to the formation of bed-sores, notwithstanding the fact that before coming into the ward two large fly blisters had been applied to the lower spinal region. The blisters had vesicated well, but the raw surfaces quite healed up during her residence in hospital.

On the morning of the 28th October, the first indications of respiratory involvement were noted. Although it could not be said that intercostal action was entirely abolished it was very slight, and the breathing seemed to be very largely carried on by the diaphragm. Nurse Keillor reported to-day that for the first time enemata could not be retained, apparently from some relaxation of the sphincter; but the functions of the bladder were quite normally performed. The paralytic phenomena were much as before, and the fœtal heart could still be distinctly heard.

On the 31st October, it was noted that the paralytic phenomena in the arms and legs were on the whole slightly improved. The grip of the left hand was a little stronger, and the right elbow could be moved a very little. The condition of the legs was much as before. Sensation was still quite normal. The respiratory function was decidedly more involved, the breathing being very shallow, and almost entirely diaphragmatic. Cough with generalised bronchial wheezing had set in, and she was quite unable to expel the tracheal contents into the mouth. The pulse was very small and rapid, numbering 120. The intellectual faculties were quite unimpaired, and she was obviously in great anxiety as to the result of her illness, a circumstance which I was inclined to regard as of unfavourable import.

Before going on to describe the terminal phenomena of

the case, a word or two may be said as to the temperature. The course of the disease was almost quite apyrexial. When I first saw the patient before admission, the temperature was about 100° F. During residence the temperature curve was practically normal, ranging from subnormal or normal in the morning to 99° F. in the evening, until the 31st October, when it began to rise and continued rising during the last day of the illness, till at the time of death 105° F. was recorded.

The condition of the bowels during residence was somewhat constipated, requiring the use of enemata. Latterly, as has been stated, the sphincter ani became somewhat relaxed, so that the injection fluid was not retained. But it is to be noted that the patient had no power to expel the contents of the rectum, and it was necessary for the nurse to aid the passage of the scybalous masses through the relaxed sphincter. Such a condition clearly indicated a pronounced paresis of the abdominal muscles.

We shall see in a little that the condition of the spleen is probably of importance in cases of Landry's paralysis. It has been already noted that there was no enlargement of the liver, and although no special note of the splenic condition has been recorded, it may be assumed that as a careful palpation of the abdomen was carried out, any considerable increase in the size of the organ was not likely to have been passed over.

Mr. W. K. Hunter, B.Sc., M.B., my medical tutor, undertook an investigation of the electrical reaction of the muscles of the arms and legs, on 27th and 29th October. On the former date, when I witnessed the examination, electrical reactions in both arms were normal, but in the left foot over the electrical centre for the extensor brevis digitorum, A.C.C. was equal to or possibly greater than K.C.C., the contraction also being slow in occurrence. The Faradic current gave no contraction.

On the latter date, however, in the left foot with a current of 2 milliampères over the extensor brevis digitorum, K.C.C. was greater than A.C.C., while with the interrupted current no contraction was obtained. In the legs there was diminished

excitability both to the galvanic and the Faradic currents, but particularly to the Faradic. At the date of this examination the legs had been completely paralysed for at least ten days, and therefore I am not surprised that some diminution of electrical excitability was found in the muscles of the lower extremities.

On the afternoon of the 31st October, the respiratory condition became the source of very great anxiety. The breathing was very distinctly diaphragmatic and much more laboured; and between 8 and 9 P.M. each succeeding breath was thought likely to be the last. The patient fully realised her dangerous condition, and the extreme state of suffering into which she then passed seemed to be entirely caused by the almost complete inability to perform the mechanical part of respiration on account of muscular paralysis. The intelligence remained acute until about 11·30 P.M., when her mind wandered a little. About half-past 12 she became suddenly sensible again, and the breathing improved considerably.

The improvement was maintained throughout the remainder of the night and throughout the day, on the 1st of November. Towards night, however, the breathing again became unsatisfactory; and about 11·30 P.M. she passed into a semi-comatose condition, which continued until the time of her death at 3·45 on the morning of 2nd November. During the last day of life the temperature rose steadily, 105° F. being registered at the time of death.

With regard to the treatment of the patient I have unfortunately but little to say. Both Dr. Burges and myself felt ourselves, from the first, to be in the presence of a fell disease, with the essential nature of which we were but imperfectly acquainted. We felt that the administration of the active remedies usually employed in cases of acute spinal paralysis was contra-indicated by the patient's pregnancy, and we were forced to content ourselves with the adoption of measures for the maintenance of her strength. After her admission to the ward the same line of treatment was pursued; and, as the idea of the spreading paralysis being the result of some toxic condition was now more definitely taking shape in the minds

of those of us who were watching the progress of the case from day to day, it was resolved to do nothing to check the sweating which had all along been a prominent feature of the case, and which it was thought might possibly be eliminative in its nature. She was placed upon a water bed, concentrated fluid food was administered at frequent intervals, she was encouraged to drink freely of water and diluent fluids, three ounces of brandy were given in the twenty-four hours, and latterly, when the respiration began to be involved, inhalations of oxygen were freely resorted to with slight temporary relief. Our efforts, however, were quite unavailing, and as I have said, she sank from failure of the respiration.

The attempts of Dr. Burges and myself to obtain the consent of her husband to the performance of a *post-mortem* examination were quite unsuccessful, and thus we have to content ourselves with a clinical diagnosis of the case. So far as I can judge, it was a very typical example of that disease which for the past thirty-six years has been known to the profession as Landry's acute ascending paralysis.

Landry published his paper on the disease which has since borne his name on the 29th July, 1859.[1] He gives a minutely detailed account of one case occurring in a weakly man of 43 years of age, in whom the disease ran its course in about seven days, and in whom a careful *post-mortem* examination revealed no appreciable lesion of the central nervous system. The history of this case was in all respects very similar to that I have just recorded, with this exception—that, whereas Landry's patient had always been delicate, ours had always been healthy until the onset of her fatal illness. In the course of his paper he refers to ten cases in all, five of which he had personally observed. Subsequent accounts of the disease, in this country at least, have been very largely based upon the original description of Landry. Indeed, if we are to accept the authority of Hilton Fagge,[2] the disease is a very rare one in Great Britain, not a single typical case having been recorded in Guy's Hospital; and one or two cases cited by Dr. Ross appear to be all that have occurred in England during the thirty years preceding the publication of Fagge's

book. Fagge himself and Dr. Pye Smith had never seen a case, but within the last five or six years a good many cases have been reported in the weekly journals.

The essential features of Landry's paralysis may be briefly stated as follows. They are:—The somewhat sudden onset, after a period of ordinary malaise, of paralysis affecting first the lower limbs, and spreading upwards, generally with great rapidity and without atrophy; the complete retention of sensation to the last; the maintenance of normal electrical reactions; the absence of any involvement of the bladder and rectum; the freedom from any tendency to bed-sores; the absence of marked fever; and, in fatal cases, the ultimate involvement of the respiratory apparatus. These features sufficiently distinguish the disease from such affections as acute myelitis and acute and subacute spinal paralyses, in all of which sensory involvemcnt, paralytic conditions of the bladder and rectum, and a tendency to bed-sores are more or less marked phenomena. It is seldom, too, that these diseases run such a rapid course or spread throughout the body so extensively. Judged by the criteria just laid down, I think it may be admitted that our case, from the clinical point of view, was a fairly typical example of Landry's paralysis.

On first seeing the patient with Dr. Burges at her own home, it occurred to me to say to him that the whole aspect of the case reminded me of two things. The first was that the morbid phenomena we were then considering together resembled very closely those of a case of fatal diphtheritic paralysis which I had seen on the 27th April, 1894, in consultation with my friend Dr. John Wright, of Anderston, and which I take this opportunity of relating to you in a sentence or two. The patient was a girl, 12 years of age. About seven weeks before I saw her, she had become ill with sore throat, which ultimately turned out to be pharyngeal diphtheria. The local condition cleared up in about a fortnight, and at the end of the third week she went for a change to Largs; but even before leaving town, a very slight nasal regurgitation on swallowing fluids had been noticed. In a day or two she returned from Largs, complaining of pain in

the diaphragmatic region; and it was observed that the palatal paralysis had in the interval beeome mueh worse, the voiee having then a distinctly nasal quality. About two weeks before my visit, marked weakness in the lower limbs set in, followed, in a day or two, by paresis of less degree in the arms. During this period also there had been mueh vomiting, whieh Dr. Wright endeavoured to control by the use of bismuth and soda. When I saw the patient, she was lying in bed almost unable to move. The voiee was distinctly nasal in character; there was a frequent ineffective cough; and the ehest was full of moist bronehial râles. The palate drooped very much, but the mucous surface of the pharynx presented quite a healthy appearance. There was almost complete paralysis of the lower limbs, the feet, as the patient lay on her back in bed with the shoulders slightly raised, being rotated outwards. The breathing was very shallow, and there was quite distinct evidence of intercostal and diaphragmatie paresis. The only part of the body whieh the patient eould move with any freedom was the head; she was perfectly intelligent and answered questions eorrectly without hesitation.

The impression I reeeived, like that whieh forced itself upon us during the last days of Mrs. M'C.'s life, was that she was dying from sheer museular failure, spreading to the respiratory apparatus. Only the most gloomy prognosis could be given, whieh was verified by the faet that two hours after my visit the girl died from failure of the breathing due to implieation of the diaphragm.

In their later manifestations, then, the features of the two cases I have now related were very strikingly similar; and Dr. Burges and I made the most careful enquiry into the possibility of diphtheria being an element in Mrs. M'C.'s illness. Although Dr. Burges was aware that diphtheria was tolerably prevalent in the neighbourhood in which she lived, our efforts to trace any eonneetion between the paralysis and diphtheria were quite unavailing. It was also in this eonnection interesting to me, when, in the eourse of my study of the present case, I came to read Landry's paper, to find that Dr. Gubler, in whose wards one of the ten eases oceurred,

in an appended note called attention to the similarity of the condition to diphtheritic paralysis.

The second thing that the condition of the patient reminded me of was the effect produced upon an animal by the subcutaneous injection of curare. There was wide-spread muscular paralysis, whilst sensation and the other functions of the economy seemed to be quite unimpaired. The impression at first received of the disease being probably of toxæmic origin became more and more intensified under continued observation in hospital.

I have now to say that the incompleteness of the case just recorded, in so far that we unfortunately failed to obtain permission to examine the body after death, is, so far as I personally am concerned, to a very limited extent compensated for by the circumstance that on the 16th February, 1894, as Pathologist to the Infirmary, I had the opportunity of performing an autopsy in a case presenting most of the features characteristic of Landry's paralysis. The case occurred in the wards of my colleague, Dr. D. C. M'Vail, to whom I am indebted for the following concise yet very comprehensive clinical summary, which he supplied for the pathological journal of the hospital, from which I now extract it:—

"The patient, Peter R., aged 27, was admitted under the care of Dr. D. C. M'Vail on the 14th February, 1894, and died the next day at 9·30 A.M. His illness began five days before admission. On the first day he began work at 2 A.M., and at 6 A.M. he complained, according to his brother, of 'prinkling' in the arms and legs. The patient himself said, however, that at first he felt short sharp pains, and afterwards a 'prinkling' sensation in the legs only, the arms not being affected for three days. He worked on the first day, always feeling his legs becoming weaker, until stopping time at 10 A.M. Then he walked home, a distance of a mile, unassisted. He went to bed early in the evening, and by next day his legs were quite powerless. Headache began on the second day. On the third there was pain in the back between the shoulders, and a sense of constriction round the lower part of the abdomen, two inches above the pubes. On the fourth day

the power of the arms, especially the right, was lost; and on the fifth, the day of admission, 'prinkling' in the face, particularly around the lips, and a feeling of intense coldness in the mouth were experienced.

"On admission there was complete loss of power in the legs and right arm, and to a less marked degree in the left arm. There was possibly, also, some weakness of the facial muscles. Sensation to touch was abolished below the level of the feeling of constriction, and it was greatly impaired in the arms, particularly in the right. Severe pain was complained of over the spine between the shoulders, and headache also was very troublesome. No diaphragmatic movement could be seen, the respiration being carried on very feebly. Deep inspiration was very limited, the xiphoid movement not being greater than about a quarter of an inch. There was no motion of the bowels, and the urine, which was passed in bed, gave a very faint sugar reaction. The breath had a very foul odour, but the temperature and the condition of the lungs and heart were quite normal. He died from loss of respiratory power, the heart acting well and strongly up to the last."

I shall now read to you the report of the *post-mortem* examination which I performed on the day after death in the presence of Dr. D. C. M'Vail:—

Summary of Post-mortem.—Fluid blood; extreme congestion of kidneys; all the other organs practically normal.

External Appearances.—Well nourished body; rigor mortis well marked; *post-mortem* lividity exceedingly well marked on the back—except over the shoulder blades, the buttocks, the calves, and the tips of the elbows, on which the body had been resting, and around the ankles, where there had been a bandage.

On exposing the surface of the brain, the convolutions are found to be somewhat dry, and very slightly flattened, as if from internal pressure; the soft membranes also present moderate opacity, but not more so than is frequently met with in cases without special nervous phenomena. The spinal dura mater presents healthy appearances, and careful dissection

of the whole brain and cord fails to detect any abnormality visible to the naked eye, the gray matter of the cord, in particular, presenting quite normal appearances.

On opening the chest the lungs are found to be quite non-adherent, and normal in appearance. The pericardium contains about 1 oz. of clear serum. The heart presents perfectly healthy appearances. In every part of the body the blood is quite fluid and drains out. The thoracic aorta is normal. The trachea and œsophagus are likewise so. Both kidneys are deeply injected, on section presenting a dark red colour. From the cut surface abundant fluid blood is easily expressed, and the capsules are quite non-adherent, the surfaces being smooth. The liver is practically normal, but the larger veins contain a large amount of fluid blood, none of the appearances of passive congestion being present, however. The stomach presents healthy characters. The gall bladder, duct, duodenum, and pancreas are normal. The contents of the stomach consist of about 2 oz. of opaque, thick, white, mucous material, for the most part "slabbered" over the mucous surface. The mucous membrane of the whole large and small intestine is carefully examined, and found to be normal. The wall of the urinary bladder is greatly thickened as if from obstruction, but a full sized bougie passes through the urethra with ease.

Here, then, we have a second case, which I think may quite justly be quoted as an example of Landry's paralysis. No doubt the record of it differs a little from the classical descriptions, particularly as regards the marked sensory involvement, the spinal pain, and the incontinence of urine noted after admission to hospital; but the striking clinical facts taken as a whole, especially the extremely rapid course of the case, and the absolutely negative result of the autopsy as regards gross lesion of the central nervous system, amply justify us in regarding the disease from which Dr. M'Vail's patient died as conforming in the main to Landry's description. As regards the morbid phenomena revealed by the *post-mortem* examination, it may be said in general terms that they were, on the whole, these which I had been accustomed to find after death

from opium poisoning, from chloroform inhalation, and from asphyxia.

But in judging of the essential nature of this second case, we are not confined alone to the naked eye appearances of the organs after death. The spinal cord was carefully hardened in Müller's fluid, and sections of portions of it were cut by the celloidin method. The sections were stained by Weigert's method and by alum-carmine, and the histological characters were demonstrated to my class of Practical Pathology in the summer session of 1894, all the students receiving specimens stained in both ways for themselves. As the result of this further examination, it was demonstrated that there was no obvious departure from the normal in the histological structure of the cord. It was suggested at the time, particularly on examination of the alum-carmine preparations, that possibly the connective tissue nuclei of the cord, so strikingly brought into view by the staining reagent, might be very slightly increased in number, but this was very doubtful and could not be insisted upon. The nerve fibres, and the multipolar cells of the grey matter presented quite healthy appearances; and, in particular, it was noted that there was no trace of sclerosis or other chronic lesion. I have recently, in view of this clinical lecture, re-examined a number of these sections prepared and stained in 1894, and I would now say that the histological appearances of the cord were quite normal. The microscopical evidence, therefore, still further confirms the diagnosis arrived at, and lends support to the opinions of those who hold that as yet, in typical cases of Landry's paralysis, no definite structural change of a characteristic kind, macroscopic or microscopic, has been demonstrated in the central nervous system.

We are now in a position to discuss briefly the pathology of the disease. In general terms it may be said that those who have investigated, either clinically or pathologically this, according to Gowers,[3] "mysterious disease," adopt one or other of two views as to its pathological nature. First, there are those who believe that the affection is caused by a primary, though it may be microscopical lesion of the nervous system,

central or peripheral. Second, there are the observers who assert that no primary lesion can be demonstrated in the nervous system, and that the disease is essentially a toxæmia, in which the poison has a selective action, in virtue of which complete muscular paralysis may be induced.

The most important contributions in support of the first view that I have been able to consult are those of Pitres and Vaillard,[6] and of Eisenlohr. The former observers examined histologically the central nervous system and the peripheral nerves in a case occurring during convalescence from typhoid fever. They found microscopical changes in the peripheral nerves, but none in the brain or spinal cord. They believe that the disease is due to a lesion of the peripheral nerves, and they do not accept the opinion advanced by certain German observers, that the basis of the disease is a "diffuse parenchymatous myelitis."

Eisenlohr,[5] on the other hand, upon examining the brain and cord in a case of acute ascending paralysis, found microscopical lesions in various parts of the cerebro-spinal axis. He therefore could not agree with his countrymen Westphal and Baumgarten, or with the French school generally, that no central lesion of the nervous system could ever be found. This could not be laid down as an axiom in the definition of Landry's disease. He has since discovered in cases of this disease micrococci of various kinds in the peripheral nerves and their terminal filaments, as well as in the spinal cord, where they appeared to have set up an acute myelitic process.[4]

Among those who believe that Landry's paralysis is due to a toxæmia, and from this point of view is thus allied to such diseases as diphtheritic paralysis, paralytic rabies, &c., may be included Westphal,[4] Baumgarten,[4] Gowers,[3] and Dixon Mann.[7] In support of this view of the pathology, it may be mentioned that Westphal has described an enlargement of the spleen as occurring in cases of Landry's disease observed by him, and it has also been asserted that in some cases enlargement of the lymphatic glands has been present. Baumgarten has published a case in which he found many rods like those of the bacilli of

splenic fever in the spinal cord, and Centanni[1] discovered a peculiar bacillus in moderate numbers in the spinal cord and in great numbers in the peripheral nerves, constituting a "neuromycosis." Gowers thinks that just as curare paralyses the lower segment of the spinal motor path, *i.e.*, the muscular nerve-endings, so some poisonous agent may in Landry's paralysis act at the termination of the upper segment of the motor path in the anterior cornua. Of course in the present state of our knowledge an opinion of this kind must largely be a matter of inference, and for a masterly exposition of the argument in favour of the doctrine that Landry's disease is due to a selective poison, I cannot do better than refer you to Dr. Dixon Mann's paper in the *Medical Chronicle* for 1887. He does not think that it is necessary to presuppose the presence of micro-organisms as factors in the production of the poison, as it may possibly be of autogenic origin. With regard to the precise locality on which the poisonous substance acts, he infers it to be situated in the grey matter of the cord itself, between the anterior and the posterior cornua. It is also assumed that the distance from the motor cells of the cortex of the nerve fibrils in the sacral and lumbar regions of the cord, from which the muscles of the lower limbs are innervated, may be the reason why these muscles are the first to be paralysed.

Viewed in the light of this short discussion of the pathology of Landry's paralysis, I think it may be admitted that so far as it goes the investigation of the two cases I have now described lends support to the theory of toxæmia. Personally, indeed, I have great difficulty in arriving at any other conclusion from the facts observed. The whole clinical course of Mrs. M'C.'s case was such as from the first to force upon us a conviction of the possibility of a morbific poison being at work in the production of the symptoms. The preliminary malaise with its slight febrile reaction, the presence of rose-coloured spots on the abdomen during the first few days of the paralysis, and the profuse sweating throughout all pointed in this direction. In Dr. M'Vail's case the *post-mortem* appearances were such as might have been produced by a

poisonous alkaloid, and the fact that a careful inspection of the gastro-intestinal canal and its contents was made at the autopsy, clearly indicates that such a possibility was prominently before our minds in connection with it. Further than this our study of the cases does not permit us to go.

The prognosis of Landry's paralysis is always admittedly grave, although cases of recovery after longer or shorter intervals are on record. With regard to treatment, I am sorry that I can add nothing to the remarks I have already made in the course of this lecture.

[After this lecture had appeared in the *Glasgow Medical Journal*, I was honoured by receiving a letter from Professor W. T. Gairdner, M.D., LL.D., F.R.S., in which he directed my attention to the exhaustive analytical study of reported cases of Landry's paralysis by the late Dr. James Ross in his posthumous work, with Dr. Judson S. Bury, *On Peripheral Neuritis*. I have also his kind permission to print the following extract from his letter:—

"Ever since I read this excellent work I have found it difficult to resist the apparent drift of the evidence that Landry's paralysis *is*, in fact, a peripheral neuritis, having some toxæmic cause not clearly ascertained. The curious speculation, founded on one or two cases, of its association with some varieties of *rabic* poison, is not alluded to by you. I happen to have seen three cases—one in hospital, two in consultation—at long intervals, in which I *believed* that Landry's paralysis existed. There was no *post-mortem* in any of them. But in the last case, a rapidly fatal one, under the care of Dr. A. of A., we were both persuaded that no other described disease than 'Landry' would fit the symptoms; and, although it did not occur to me at the time of the consultation, a subsequent enquiry brought out the fact that the young man *had* been bitten by a dog, supposed to be rabid, some months before. *Valeat quantum.* Dr. A. half intended publishing the case, but has not done so."]

REFERENCES.

[1] Landry, *Gazette Hebdomadaire*, tome vi, 1859, p. 472.

[2] Fagge and Pye-Smith, *Practice of Medicine*, 1891 (third edition), vol. i, p. 456.

[3] Gower's *Diseases of the Nervous System*, 1892 and 1893 (second edition), vol. i, p. 380 ; vol. ii, p. 930.

[4] Pepper, *Practice of Medicine by American Teachers*, 1893, vol. i, p. 748.

[5] Eisenlohr, *Virch. Arch.*, 1878, lxxiii, p. 73-92.

[6] Pitres and Vaillard, *Arch. de Physiol.*, 1887, 3 s. ix, p. 149-163.

[7] Dixon Mann, *Medical Chronicle*, 1887, vol. vi, p. 99.

LECTURE II.

CASE OF MEDIASTINAL TUMOUR INVOLVING THE ROOT OF THE LEFT LUNG.[1]

To-day I intend to direct your attention to a case of mediastinal tumour, the presence of which was not recognised during the life of the patient, but only when we had the opportunity of investigating the disease *post-mortem*. As regards diagnosis there were certain difficulties, a consideration of which now may be of service to us in dealing with future cases of the same kind. Our experience of this case is an apt confirmation of the truth that our failures in diagnosis frequently teach us as much as our successes, and if a study of the vital phenomena observed and recorded in the ward and of the facts revealed in the *post-mortem* theatre enables us in some measure successfully to grapple with similar cases as they may from time to time occur, the present recapitulation will not be without benefit to us all.

Fortunately the failure to relate the symptoms and signs to the fundamental structural changes giving rise to them did not lead to any error in the mode of treatment adopted, which, as we shall see, would not have been in any way altered had we been successful in recognising the true anatomical basis of the illness. As we go on with our study of the case, however, you will be impressed by the striking manner in which the story of it emphasises the important truth that no detail of the clinical history or the physical examination of a patient should be overlooked, or should be

[1] Delivered Saturday, 11th January, 1896.

regarded as too trifling to be recorded. None of the more striking and characteristic pressure symptoms of mediastinal new growth were present, but you will see that many of the symptoms which had perhaps been too lightly regarded, or attributed possibly to some other than the true cause, acquire, in the light of the *post-mortem* examination, an altogether new diagnostic significance. On one or two occasions, indeed, we were within a measurable distance of arriving at a tolerably correct view of the nature of the case, but during the latter days of the illness, the question of diagnosis was entirely subordinate to the more important matter of endeavouring to relieve the distress of the patient, towards which end all our energies were fully bent.

I shall now recall to your minds the main details of the case, some of which you may have already taken down in your note-books during our ward visits. For the clinical history and notes of the progress of the illness I am indebted to Mr. Archd. Young, B.Sc., M.B., house physician, and to Miss Edith Goodrich, clinical clerk.

Mrs. B., æt. 45, was admitted to Ward 8 on 9th November, 1895, complaining of breathlessness, and paroxysmal cough of about one month or six weeks' duration. Previous to this she had never been ill, and at the time of the onset of these symptoms she thought she had merely got a chill after a wetting. At first she experienced what she termed "a cold in the head," characterised by shivering, cough, and general malaise. For about a fortnight, in spite of this, she went about, but at the end of this time she had to take to bed, chiefly on account of the cough, which had all along been markedly paroxysmal, causing her face to become much congested during the paroxysm, and preventing sleep at night. Occasionally the stress of the cough brought on a slight degree of hæmoptysis, and not unfrequently the fit terminated in vomiting. During the fit of coughing she complained at times of pain over the left shoulder behind, and slightly in the left infra-clavicular region, towards its outer aspect. The pain was of a stabbing character. Occasionally the violent coughing gave rise to the involuntary passage of urine, a

symptom which became more and more marked during the progress of the illness. Her appetite from the start of her trouble was much impaired, but the function of the bowels was always satisfactorily performed.

The family history threw no light upon the case, both of her parents having died when she was too young to remember anything of them. She was one of a family of five, of whom two were dead, one in childhood of scarlet fever, the other in giving birth to a child. The patient herself had three children and one miscarriage. Two of her children were still-born, and one died at the age of 7 of "water in the head." Before the onset of her last illness she had not considered herself liable to take cold easily, and had never suffered from bronchitis.

The patient on admission suffered from considerable dyspnœa, and, by inadvertence, having been allowed to walk up stairs, she arrived in the ward almost helpless from want of breath, with her face very livid. Next day it was noted that there was still considerable congestion of the face, as well as of the ears, fingers, and toes. No œdema could be made out in the legs, but there was just a suspicion of it, which was never again observed, on the backs of both hands. The patient was a very stout woman, the breasts being large and very pendulous. Chiefly on this account it was found impossible to localise the apex beat, or to map out the area of cardiac dulness. The cardiac sounds, however, although weak, were made out to be quite pure, the second being possibly accentuated over the pulmonic area. The pulse numbered 120 per minute, and was regular, though rather weak.

The movements of the chest were rather limited. The pulmonary percussion note was on the whole clear over the entire front, but on account of the thick layer of adipose tissue it was difficult to make precise statements as to percussion, particularly over the posterior aspect of the chest. For the same reason also the respiratory murmur was everywhere found to be somewhat feeble, particularly towards the bases. On forced respiration, however, distinct prolongation of expiration, with abundant sonorous, sibilant, and moist crackling râle could be made out everywhere, but especially

posteriorly and inferiorly. The vocal fremitus and resonance, on account of the stoutness, could not be made out with distinctness at any part.

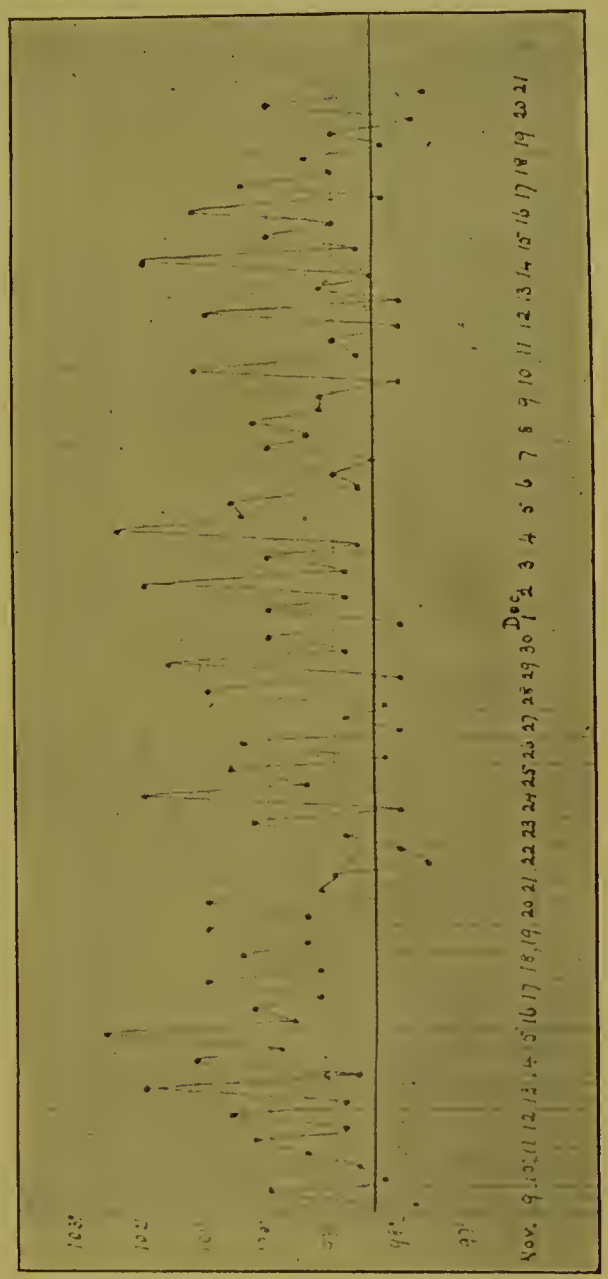
There was no abdominal tenderness, and no sign of any hepatic enlargement. The urine contained a slight trace of albumen, and was rather high coloured, throwing down a tolerably abundant deposit of pink urates.

During her residence in the ward the following were the chief clinical phenomena noted:—The attacks of coughing gradually increased in severity, and they were always worst in the night time. The dyspnœa, especially during the last week or two, was always greatly aggravated after an attack of coughing. The expectoration was never abundant, but was frothy and muco-purulent in character. The cough, except doubtfully during the last day or two, had no special brassy or incomplete character such as might have suggested its origin in reflex irritation due to pressure rather than in generalised bronchial catarrh. Its paroxysmal character, however, was always marked, and this feature was not sufficiently taken into account in estimating the nature of the case. During an attack of coughing, too, I often observed a hernia-like bulging above the left clavicle, which was highly suggestive of an emphysematous protrusion of the apex of the left lung. This swelling entirely subsided when the cough ceased, and palpation in the left supraclavicular region revealed nothing. At no time was any definitely localised œdema of the face, the neck, or the arms observed.

Towards the end the patient lost considerably in flesh, and possibly on this account there was detected on one or two occasions, and specially on the 12th December, a comparative dulness at the left base posteriorly. It was also thought that the respiratory murmur was quite distinctly feebler and more distant over the dull area than elsewhere, but these signs were never of such a pronounced character as to rivet the attention upon them, although, as we shall see, they were of very great importance. Generalised sonorous and moist bronchial râles could, as a rule, be made out, distributed more or less abundantly throughout the whole chest. I shall now read to

you a note which I entered in the ward journal two days before the fatal issue.

19th December, 1895.—In spite of all treatment the cough has continued very severe, particularly during the night. The temperature showed a markedly remitting character, the evening record being usually from one to two degrees higher than the morning, and, though usually between 100°F. and 101° F., occasionally reaching 102° F. or over. On the whole, the morning temperature is rather above than below the normal, and from 14th to 22nd November it was never below 99° F. The character of the febrile movement is well shown in the accompanying illustration, which is from a photograph by Mr. Archibald Young, B.Sc., M.B., of the temperature chart prepared by Nurse Mason. The temperature curve at one time suggested the possibility of a tubercular basis to the bronchial affection, but no unmistakeable physical sign of this could be detected. Physical examination of the heart has also been excessively difficult on account of the patient's stoutness. During the



last two or three days the breathing has become exceedingly laboured, necessitating her sitting up in bed, the difficulty being chiefly experienced during inspiration, the accessory muscles being vigorously employed for the indraught of air, which takes place with considerable noise and a slight throwing back of the head. Expiration is accompanied by an audible sigh.

On the evening of the 19th the note was continued as follows:—The breathing has continued laboured the whole day, in spite of frequent oxygen inhalations, and about 9 P.M. the difficulty was so extreme that a hypodermic injection of strychnine and strophanthus was administered by Mr. Young.

At 9·30 P.M. I saw the patient, who was complaining loudly of a choking sensation in the throat. On examination of the back no râles could be heard, but a very strikingly prolonged and laboured condition of the expiratory murmur was an exceedingly marked feature. Having regard to all the circumstances, and especially to the fact that she was actually in danger of suffocation, it was decided to perform venesection, and about $10\frac{1}{2}$ oz. of blood were removed from the left arm. At first the blood did not flow so freely as afterwards, when it came in a continuous stream, varying in force with the respirations.

An attempt at percussion of the heart, before the phlebotomy, indicated an extension of the cardiac dulness to the right and also upwards as high as the second interspace. The sounds of the heart could not be heard on account of the laboured breathing. Orthopnœa remained extreme until the time of her death on 21st December, 1895.

In the note which I have just read, I have given you some account of the treatment adopted for the relief of the patient during the last days of her illness. A word or two will suffice to give you an idea of the therapeutic measures adopted from the time of her admission.

On the 11th November she was put upon the following mixture, with a view both to strengthen the heart and relieve the cough:—

℞.—Tinct. digitalis,	. . . . .	1 dr.
Tinct. nucis vomicæ,	. . . .	2 drs.
Spt. chloroformi,	. . . . .	4 drs.
Infusi cascarillæ,	. . . . ad.	6 ozs.—M.

Sig.—Half an ounce three times a day.

A liniment of equal parts of olive oil and oil of eucalyptus was also ordered to be rubbed over the chest night and morning. On the 16th November this mixture was stopped, and, as the most urgent symptom was the coughing at night, 20 minims of nepenthe were ordered at bedtime. At the same date she was put upon 2 oz. of brandy in the twenty-four hours, which was increased to 3 oz. on the 8th December. Soup, beef-tea, milk, and Carnrick's liquor carnis were frequently administered; and during the last fortnight of life 5 minims of tincture of strophanthus were given every two hours during the night. On the 16th December oxygen inhalations were commenced, and were continued to the end. The relief afforded by these, though exceedingly transient, was so marked that the patient would have constantly kept the inhaler at her mouth when the dyspnœa was severe. The venesection also seemed to give relief for some hours.

All along I felt great difficulty in formulating a precise diagnosis, but on the whole I was inclined to think that we had to deal with a severe bronchitis, complicated by the presence of a weak and probably fatty heart, with, during the latter stages, considerable engorgement of the chambers of its right side. The detection of the dulness at the left base behind raised the question as to whether there might not be in addition a broncho-pneumonic condition, possibly of a tubercular type, a supposition favoured by the markedly hectic character of the temperature curve.

Before going on to consider the phenomena observed in the clinical course of the case, which, as we can now understand, indicated the presence of a solid growth within the chest, I will read to you the notes of the *post-mortem* examination, which was performed on the 23rd December, 1895, by Mr. David M'Crorie, Assistant Pathologist to the Infirmary:—

The pupils were slightly dilated and equal; and rigor mortis was markedly present. Subcutaneous fat was very abundant, there being a thickness of at least an inch and a quarter on the front of the abdomen. The omentum and the peritoneum generally were also loaded with fat.

On opening the chest, a white lobulated mass was found occupying the anterior mediastinum, lying behind the upper half of the sternum, and extending downwards towards the root of the left lung. Anteriorly the portion in contact with the sternum was about the size of a hen's egg, and the whole growth occupying the mediastinum (including the bifurcation of the trachea and aortic arch) was about the size of the closed fist. The tumour had extended into the left lung, chiefly along the wall of the main bronchus, but also surrounding the stem of the pulmonary artery. The left lung was firmly adherent posteriorly, and on separation of these adhesions a small secondary nodule was found in the substance of the thickened pleura. Anteriorly the left pleural cavity contained, in a series of loculated spaces formed by old adhesions, about 12 oz. of clear serum. The tumour had not involved the substance of the pericardium, but pressed against it at its upper and left aspect. There was no pericarditis; the internal surface of the pericardium was smooth, and in the cavity were about 3 oz. of clear serum. The lower lobe of the left lung was solid, the consolidated area presenting the peculiar greenish, watery, and sloughy character indicative of a commencing gangrene. The tumour tissue completely surrounded and compressed the left bronchus, but had not encroached upon the pulmonary tissue to any great extent. The base of the right lung was in a state of intense hypostatic engorgement.

The surface of the right ventricle was loaded with yellow fat, and presented the characteristic features of fatty infiltration of the heart. The aortic and pulmonary curtains were competent, and the valvular structures generally presented healthy appearances. The liver, the kidneys, and the spleen presented nothing abnormal.

The naked-eye appearances of the growth were those of lympho-sarcoma, and this opinion of its nature was after-

wards confirmed by Dr. Charles Workman, who undertook a microscopic examination of the tumour. He reports that the histological structure was characteristically that of a lympho-sarcoma. In my experience this type of tumour is by far the most common form of solid growth met with in the mediastinum, but I cannot now enter into details as to the pathology of mediastinal tumour. Those of you who care to know my views on this, and to study the varieties and relationships of mediastinal neoplasms, may refer to my book on the subject, which you can consult in the library of Queen Margaret College.[1] In it you will find recorded a number of cases, which it will be useful for you to compare with that we have been considering this morning; and if you will go into the museum of the Infirmary you will find in Series X a number of characteristic specimens which I have dissected and described.

To return for a little to the clinical aspects of the present case, while it must be freely admitted that a number of the phenomena observed in the ward assume a totally different significance in the light of the *post-mortem*, it may also be granted that in reference to the diagnosis of a mediastinal solid growth the case was one of no little difficulty, and that chiefly because of the absence of most of the characteristic pressure signs and secondary manifestations. In my study of new growths of the mediastinum, I have come to the conclusion that the most useful diagnostic points are the following:—(1) the development of fulness and nodular or glandular projections beneath the clavicles and in the neck; (2) the development of secondary nodules; (3) spasmodic asthma, and paralysis of the vocal cords; and (4) local œdema and local venous varicosity. In our case all of these phenomena were absent except the spasmodic dyspnœa following the attacks of coughing. It is to be observed also that the cough, though coming in paroxysms chiefly at night, did not otherwise, except doubtfully during the last two days of life, differ from an ordinary bronchial cough of considerable severity. We can

[1] *The Pathology of Mediastinal Tumours, with special reference to Diagnosis.* London, 1892.

see now, however, that had we directed our attention more closely to the association of the paroxysmal cough with the physical signs detected at the base of the left lung, we might have been led to a correct view of the essential nature of the case. There never was any hoarseness or loss of voice. We can now understand, also, that the comparative dulness and deficient breathing made out at the left base were caused partly by the consolidation of the lower lobe of the left lung and the moderate pleural effusion towards the front, and partly by the narrowing of the left bronchus. It further becomes obvious that the dulness I made out over the upper part of the sternum was not due to a distended right auricle, but to the solid mass in the anterior mediastinum. The hectic type of the temperature curve, which also entered as a confusing element in our investigation of the clinical phenomena, can now be explained as the result of gangrenous and pleuritic processes going on at the left base.

I have thus endeavoured to point out to you the leading details of this difficult and puzzling case, and I trust that the somewhat minute study we have made of it may impress upon you this lesson, that in dealing with an obscure case it is absolutely necessary to weigh most carefully all the possibilities that the clinical phenomena or the physical signs, taken individually or in association with one another, may indicate.

LECTURE III.

ON THE NAUHEIM (SCHOTT) METHODS OF TREATMENT AS APPLIED TO CASES OF CARDIAC VALVE DISEASE OF RHEUMATIC ORIGIN.[1]

If we exeept the new photography, there is perhaps no subject which has attracted more attention in the medical journals, during the past winter, than that of the Sehott methods of treatment as applied to the diseases of the heart. The results, whieh have been published showing their beneficial influence in the treatment of dilatation and valvular disease of the heart, are certainly, if they may be wholly trusted, most wonderful; indeed, in one of our Glasgow medical societies I have heard them deseribed as marvellous. During the clinieal course, which is just now elosing, we have had under observation in the wards a large number of cases of eardiac valve disease, and being duly impressed by the aeeounts of the wonder-working powers of the Nauheim system, I determined, if possible, to try the method in one or two of them. Briefly stated, the treatment consists of two parts, whieh may be used separately or together, according to the judgment of the physician and the necessities of the case: (1) The use of a series of saline and effervescing baths of slowly increasing strength and diminishing temperature; and (2) the employment of a regulated series of resisted movements, "widerstand-gymnastik," as they have been denominated by their inventors. I shall describe the composition of the baths immediately, but, in the meantime, let me say that I purpose in the present lecture to deal in detail with three of our eases of rheumatic

[1] Delivered Friday, 3rd April, 1896.

cardiac valve disease in which the Schott treatment was attempted. In only one of these could it be fully carried out; in the other two it may be said to have failed. We have had under observation in the wards, during the same period, a number of other cases almost precisely similar as regards the age of the patients and the character of the valvular lesions, and treated by the usual remedies, to which, if necessary, I may refer, but not in detail, for purposes of comparison, in giving you my opinion upon the suitability of the Nauheim system for this class of case.

In the preparation of the baths we used as a guide the paper of Dr. Robert Saundby, which was published in the *British Medical Journal*, 2nd November, 1895, p. 1081. In all our baths 40 gallons of water were employed, sufficient completely to immerse the patient's body, the chin resting on the surface of the water. The patient remained without movement in the bath for a period varying from six to ten minutes, and the temperature of the water was gradually reduced from 96° F. at the beginning of the course, to 87° F. at the end of it. A series of five saline baths, according to the following formulæ, were made use of:—

No. 1 bath contained 4 lb. of common salt, and 6 oz. of chloride of calcium.

No. 2 bath contained 5 lb. of salt, and 8 oz. of chloride of calcium.

No. 3 bath contained 6 lb. of salt, 10 oz. of chloride of calcium, 10 oz. of bicarbonate of soda, and 8 oz. of hydrochloric acid.

No. 4 bath contained 7 lb. of salt, 10 oz. of chloride of calcium, 10 oz. of bicarbonate of soda, and 12 oz. of hydrochloric acid.

No. 5 bath contained 9 lb. of salt, 11 oz. of chloride of calcium, 1 lb. of bicarbonate of soda, and 18 oz. of hydrochloric acid.

Baths Nos. 3, 4, and 5 were effervescent, and the bicarbonate of soda was gradually added to the water during the whole period of the patient's immersion, so as to keep up a continual effervescence. The amount of carbonic acid given off from

No. 5 bath was quite sufficient to be somewhat disagreeable to the sensations both of the patient and the attendants.

The resisted gymnastic exercises were carried out five days a week by Misses Spence Watson and Rosa Wilson, experts in this department of therapeutics, who, at my request, most kindly volunteered to carry out this part of the treatment. For a full account of these movements and the method of carrying them out I would refer you to Dr. Bezly Thorne's book on the Schott methods of treatment (London, 1895).

For the clinical histories of the cases, the pulse tracings, and the outline diagrams of the chest, which were carefully copied at the time from the areas of dulness marked out on the patient's body by myself, I am indebted to Mr. Archd. Young, B.Sc., M.B., my house physician, and for the careful management of the baths, frequently under my own supervision, I am under obligation to Staff-nurse Keillor and her probationers.

CASE I.—*Mitral Disease, with well-marked regurgitation, of rheumatic origin; full course of baths and exercises; improvement as regards general health and dyspnœa, but condition of heart, as tested by character of murmur and apex beat, practically unchanged.*

Annie M'D., æt. 13, was admitted to Ward 8 on the 28th January, 1896, suffering from cardiac valve disease, on the recommendation of Dr. Marion Gilchrist, to have treatment by baths and exercises. She had scarlet fever four years ago, and was in an hospital at Airdrie for some weeks. With this exception she seems to have enjoyed good health until two years ago, when she had an attack of rheumatic fever, which lasted about a month, and from which she seems to have made a very good recovery. She remained well until September last (1895), when she suffered for a week from "a bad cold and cough," and after going about for a week with this she took a second attack of rheumatic fever. She states that after a fortnight in bed at this time she got up and went about for three days, but on account of her feeling stiff and sore and being very breathless, with troublesome

palpitation, she returned to bed at the advice of Dr. Marion Gilchrist, where, it seems, she has remained since. The breathlessness was noticed first at this time.

It is stated that the wrists and ankles were involved earliest in the attack of September last, but all the other joints became involved also. It is doubtful, however, how far this statement is to be relied on, as patient has difficulty in giving satisfactory answers. Her legs have never been swelled. She takes her food well, and her bowels are regular. The pain returned somewhat to the right wrist and hand, but when cannot be definitely ascertained. The affected joints were, at the time of the fever, much swollen.

Her father and mother are healthy. She has two brothers and two sisters alive and well; a brother died of "scarlet fever and dropsy;" a sister of scarlet fever and some "fit" during it.

Examination on Admission.—She lies comfortably enough in bed in the dorsal decubitus. She says that even lying quietly in bed she is conscious of excessive beating of the heart. Her colour is good, the cheeks rather flushed.

On inspection of the præcordium, somewhat diffuse pulsation is visible over the fourth and fifth interspaces. The point of greatest intensity is about $3\frac{1}{4}$ in. from the mid-sternal line in the fifth interspace. There is also slightly undue pulsation at the root of the neck in front. The area of cardiac dulness is distinctly increased in size, measuring at greatest transverse width $4\frac{1}{2}$ in. The right border passes $\frac{3}{4}$ in. to right of the mid-sternal line; the upper reaches the upper edge of the fourth rib; the outer reaches $3\frac{3}{4}$ in. to left of middle line. The first sound over the apex has a very loud and forcible beginning, and terminates in a loud and long blowing murmur. This murmur is heard well over the back at almost any point, and is also conveyed well out into the axilla. Passing in towards the sternum it diminishes in intensity, and at a point midway between the apex and middle line it is rather hard to make out. It is, however, never entirely lost. Going further in and up towards the base the murmur becomes, if anything, more audible, but this is more notable over the pulmonic than

over the aortic area. The second sound is not easily heard at the apex, but over the pulmonic area it is very strikingly reduplicated.

The V.S. murmur is conveyed, to some extent, into the vessels of the neck. The pulse numbers 84 per minute, is of only moderate tension, but is regular in rhythm.

The liver dulness measures 1 in., 2½ in., and 3 in. in the middle, nipple, and mid-axillary lines. There is no tenderness on palpation of the liver. There is no enlargement of the spleen. The lungs are examined with negative results. The tongue is slightly coated.

31st January, 1896.—Urine, specific gravity, 1022; very acid, pale amber colour, flocculent deposit, no albumen or sugar.

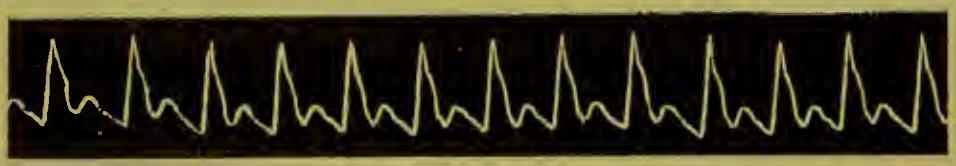


Fig. 2.—Annie M'D. (Case I). Before first bath of the course.
This and the other tracings illustrating this lecture were taken by Mr. Arch. Young, B.Sc., M.B.

In view of a saline bath to be given this morning, the physical signs and the pulse condition are reinvestigated at 9·40 A.M. As regards the cardiac condition and the area of cardiac dulness, no difference from that recorded in the previous note can be made out, the measurements, condition of the impulse, and the cardiac sounds being precisely similar. The pulse as tested by the sphygmograph is distinctly and almost fully dicrotic. It numbers from 92 to 96 per minute, observed lying in bed, and over several minutes.

Fig. 3.—Annie M'D. (Case I). After first bath of the course.

At 9·51 A.M. she entered No. 1 saline bath at a temperature of 96° F., and left it at 9·58 A.M.

After she had been four minutes in the bath the temperature of the water was ascertained to be 95° F. At 10·1 A.M., three minutes after the bath, the pulse in the dorsal decubitus, in bed, numbered 100, and five minutes later 96. The sphygmograms taken respectively five and seven minutes after the bath show, if anything, a very slight decrease in the degree of dicrotism; but the tracing is still characteristically one of low tension.

A careful examination of the præcordial area within ten minutes of leaving the bath reveals no change. In particular, the apex beat is not altered in position.

1st February.—Another bath to-day. Before the bath, at 9·48 A.M., the pulse in the dorsal decubitus numbered 100 per minute; at 9·58 A.M. she entered the bath. The sphygmogram before the bath was much as noted yesterday, being fully dicrotic. No appreciable change in the characters of the sphygmogram after the bath, nor in the measurements of the cardiac dulness, could be observed. The pulse after the bath numbered 98 per minute in the dorsal decubitus.

7th February.—The baths have been intermitted on account of the patient's menstruating, and are resumed to-day. The pulse, counted in bed a few minutes before the bath, and over two or three separate minutes, numbers 96, is of fair strength, with an occasional irregularity of time. The sphygmogram at the left radial shows perhaps a slightly less forcible percussion wave, but the dicrotism is perhaps not so pronounced as previously noted. Bath No. 1, temperature 95° F., was administered. During the last minute in the bath the pulse numbered 96, one observer counting 98, the other 94. In bed, five minutes after the bath, the pulse numbered 90.

The cardiac area, apex beat, and condition of the murmur were investigated before and twenty minutes after the bath, and no appreciable alteration in any of them could be made out. As regards comparison with the previous note, however, Dr. Steven has the impression that the V.S. murmur is not so audible at the base, and he doubts if it can be heard in the vessels of the neck. The reduplicated second pulmonic sound

is still very marked. Half an hour after the bath the pulse numbered 89 over a whole minute.

8th February.—Another bath is given to-day. Five minutes before the bath the pulse in the dorsal decubitus numbered 88; during the last minute in the bath, pulse 92; immediately after, 82; fifteen minutes after, 82; thirty minutes after, 82.

Before the bath the cardiac apex was found to be less punctuate than formerly 3 in. from middle line; the right border of cardiac dulness $\frac{3}{8}$ in. nearer the middle line; the transverse diameter, 4 in. Sphygmogram of the right radial was dicrotic, but not fully so.

Five minutes after the bath the left border of cardiac dulness was possibly half an inch nearer the middle line, and the apex beat could hardly be felt as a punctuate beat, apparently because it was behind the fifth rib. The sphygmogram was as before.

On the 11th February Misses Rosa Wilson and Spence Watson commenced a course of resisted gymnastic movements, and these were continued five days weekly till the end of the treatment.

12th February.—No. 2 saline bath is given to-day, and before it the following facts are made out:—Pulse, 82 per minute in the dorsal decubitus, in bed; the sphygmogram, if anything, shows less dicrotism; the area of cardiac dulness measures only 4 in. across, the diminution being chiefly on the right side, the right border being only half an inch to right of middle line. The apex beat is practically in the same situation—fifth interspace and $3\frac{1}{8}$ in. from the middle line. The cardiac condition as regards murmurs is as at previous note. The pulse during the last minute in the bath numbers 92. One minute after going back to bed the pulse numbers 84. The sphygmogram shows comparatively little alteration; if anything, however, the tension is a little higher. Ten minutes after the bath the apex beat is found to be in precisely the same situation. The area of cardiac dulness is less by half an inch in transverse measurement than before the bath, the decrease being at the expense of the left border. It is noted, however, that considerable difficulty exists in

mapping out the cardiac area on account of a very loud tympanitic stomach note, the presence of which has probably had considerable effect in diminishing the area of dulness.

18th February.—The bath was not given yesterday on account of a slight sore throat and a pain in left knee which the patient complained of. To-day No. 3 bath is given.

The pulse before bath numbered 84; in bath during last minute, 88.

The sphygmogram before bath is still markedly dicrotic. The apex impulse is $3\frac{3}{8}$ in. from middle line. The cardiac dulness $3\frac{1}{2}$ in. across, the right border being at the mid-sternal line.

The murmur is very loud at apex, thought indeed to be as loud as ever it has been, possibly louder than ever.

Pulse fifteen minutes after bath, 76; thirty minutes after, 78. The sphygmogram after, if anything, more dicrotic. The cardiac dulness and the apex beat are quite unaltered.

24th February.—Before No. 4 bath to-day the pulse is 90; the apex beat in fifth interspace $3\frac{1}{2}$ in. to left of middle line;

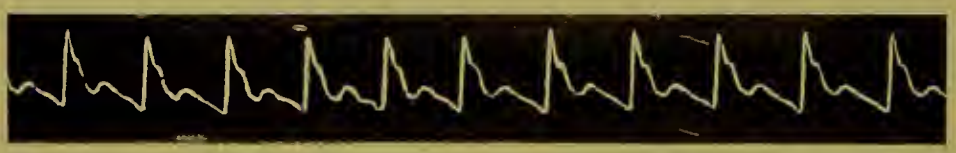


Fig. 4.—Annie M'D. (Case I). Before fourteenth bath of the course.

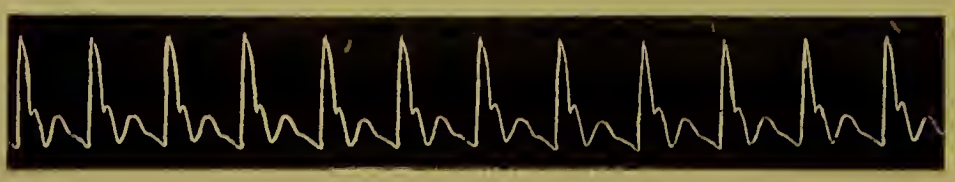


Fig. 5.—Annie M'D. (Case I). After fourteenth bath of the course.

and the area of cardiac dulness measures 4 in. across, the right border being half an inch to right of middle line; the upper in middle of third interspace. After the bath, while in bed, the left border was found about half an inch nearer the middle line; the apex beat was not altered in position, and in every other respect the cardiac conditions were as before the

bath. The pulse, however, in bed after the bath numbered 78; but taken every three minutes during the bath it numbered 90, 93, 94; half an hour after, 87. There was no pinkness of skin at any time in the bath.

7th March.—Another note of cardiac condition is made to-day. The cardiac dulness measures 4 in. across; the apex beat is unaltered; pulse to the finger, before No. 4 bath, is dicrotic, and the sphygmogram confirms this. After the bath the tension of pulse is possibly higher, but the area of cardiac dulness is quite unchanged.

The treatment by baths was stopped upon 26th March, 1896, and the last of the Swedish exercises was given the next day, when I made the following observations upon the physical signs before and after them:—

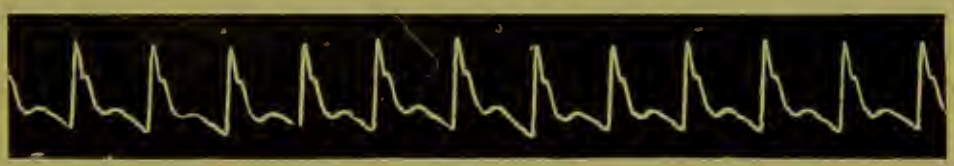


Fig. 6.—Annie M'D. (Case I). Before thirty-first bath of the course.

Fig. 7.—Annie M'D. (Case I). After thirty-first bath of the course.

Before the exercises, the patient being in bed, pulse 78. The apex beat was in the fifth intercostal space, 4 in. to the left of the middle line. The right border of cardiac dulness was half an inch to the right of the middle line, the left border was difficult to delimit on account of the encroachment of a highly tympanitic gastric note, but as nearly as could be made out the greatest transverse measurement was $3\frac{1}{2}$ in. The V.S. apex murmur was, as usual, loud and harsh.

A few minutes after the exercises, when the patient had returned to bed, the pulse numbered 75; the position of the

apex beat and the area of the cardiac dulness were quite unchanged; and the mitral murmur was very loud.

After this date the course of treatment was regarded as finished, and the patient was allowed to be up and to move about the ward. During the treatment she had been confined to bed, and this enforced rest must also be taken into account in estimating the results of treatment.[1]

Case II.—*Mitral Disease, with well-marked regurgitation, of rheumatic origin; great dilatation of heart, with angina-like pain; attempt to treat by baths followed by chorea; effect of exercises evidently to increase cardiac hypertrophy.*

Annie J., æt. 17, domestic servant, was admitted to Ward 8 on 4th December, 1895, on account of severe præcordial pain and increasing breathlessness.

In April, 1894, the patient had an attack of acute rheumatism, in which all the large and small joints of both upper and lower extremities were involved, and about a week after the onset of this illness she began to experience præcordial pain on the slightest exertion, and very little exercise brought on intense breathlessness.

She went into the Western Infirmary, under Dr. Tennent, at this time, and was resident there for about five months. She never got rid of the præcordial pain, but was sent at the end of this time to Lanark Convalescent Home, where she remained for six weeks. She was only a week or two home, when severe præcordial pain and increasing breathlessness on exertion compelled her to seek advice at the Dispensary of the Glasgow Royal Infirmary. She was seen there by Dr. Dunlop, and recommended to the wards.

A year before the attack of acute rheumatism, she had rheumatism of most of her joints, but without any marked fever. Her legs have never swelled, except in the course of the rheumatic fever, around the several joints affected. The joints most severely involved were those of the ankles and wrists. The cause of her rheumatism, she

[1] This patient, who had been a fortnight at the Lenzie Convalescent Home, was shown at a clinical demonstration given in my wards to the members of the Glasgow Eastern Medical Society on the 22nd April last. The improvement in the general condition was well maintained, and she had no dyspnœa. The apex beat was practically in the same position, and the murmur was as loud as ever.

thought, was a chill got after wetting herself in washing, a part of her work as a domestic servant. While at Lanark she first became conscious of her heart beating very violently, and since then this symptom has become more distressing.

Her father died of some bronchial or asthmatic trouble. Her mother still lives and enjoys good health. Four sisters are alive and well; four others and one brother died in infancy.

Examination on Admission.—She is thin and emaciated. The face is pale, the eyes lustrous, and pupils dilated. Tongue moist and red. The lungs show no abnormal signs. The cardiac dulness measures $4\frac{1}{4}$ in. across; its upper edge is on a level with the upper edge of the fourth rib, its inner, half an inch to right of mid-sternum, and the outer just outside nipple line.

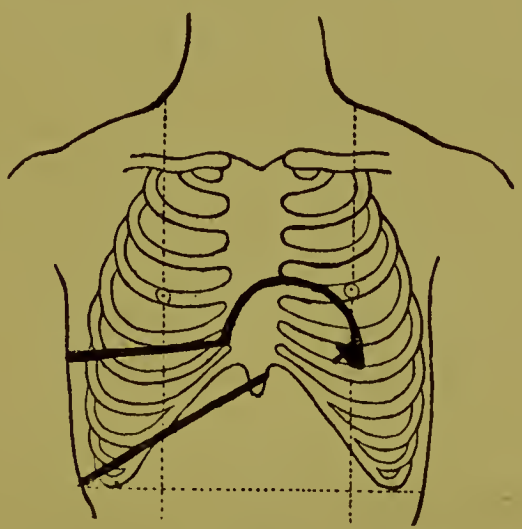


FIG. 8.—Annie J. (Case II). On admission.

There is somewhat diffuse pulsation visible over the præcordial area, but probably the most punctuate beat is about $3\frac{1}{2}$ in. out from mid-sternum in the fifth interspace. Over this area a well-marked V.S. murmur of a pronounced blowing type is audible. It has a somewhat abrupt sharp beginning, almost suggesting an A.S. element. The second sound is pure over this area. Passing in and up, away from the area of cardiac dulness as mapped out, the murmur gets less distinct, and is almost immediately lost on passing over the upper margin. Over the aortic and pulmonic cartilages the first sound is heard almost pure, and the second is very loud and staccato in quality, especially over the pulmonic cartilage.

Great pain and sense of abnormally tumultuous cardiac action over præcordial region are complained of, and at present, 10 P.M., she is obliged to sit up in bed, in a position midway between dorsal decubitus and complete orthopnœa.

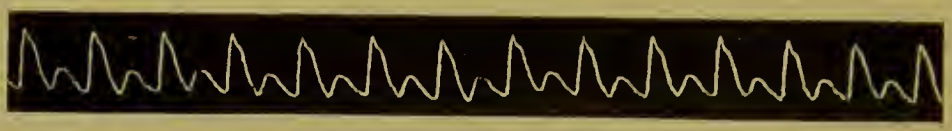


FIG. 9.—Annie J. (Case II). On admission.

The pulse is of low tension, fairly regular, but very rapid, numbering 130 beats per minute. The liver measurements are $1\frac{1}{4}$ in., 3 in., $3\frac{1}{4}$ in. in the middle, nipple and mid-axillary lines respectively. Very little hepatic tenderness is noted.

No swelling of the legs. Menstruation began last April, but only one period has been experienced. Since the first onset of the function no further menstrual flow has occurred.

Urine, specific gravity, 1026; acid in reaction; amber colour; mucous deposit; no albumen; no sugar; phosphates.

6th December.—The obvious features of this case are those of well-marked mitral regurgitation without any very obvious signs of generalised passive congestion. The pulse is quite appreciably dicrotic even to the finger.

30th December.—At 10·7 A.M. the pulse numbered 94, being small and, to the finger, somewhat dicrotic. The respirations were

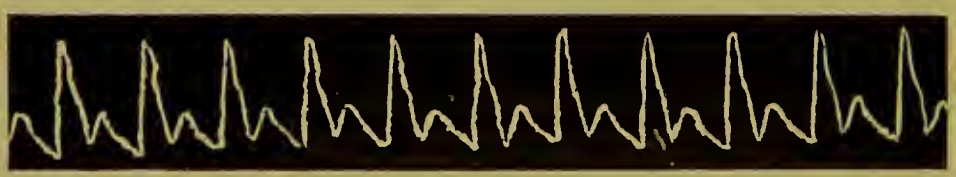


FIG. 10.—Annie J. (Case II). Before saline bath No. 1. High up-stroke probably due to excitement.

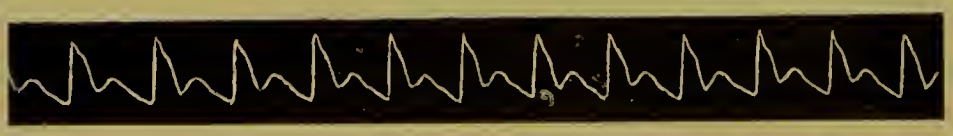


FIG. 11.—Annie J. (Case II). After saline bath No. 1. Dicrotism less.

28. With the sphygmograph the pulse (patient in bed and recumbent) presents a characteristically dicrotic character. At 10·35 A.M., after mapping out the cardiac dulness and taking the sphygmogram, the

pulse numbers 100. The apex beat is forcible, occupying the fourth intercostal space within the nipple line, and about 3 in. from the middle line. The right border of cardiac dulness is $\frac{3}{4}$ in. to right of of middle line, the upper in middle of third intercostal space, the outer passes downwards just outside the apex beat, the total transverse measurement being $3\frac{7}{8}$ in.

Saline bath at 10·41 A.M.; remained in it for six minutes. At 10·49 A.M. (patient again recumbent in bed) pulse numbered 96, and the sphygmogram indicated less dicrotism than before, and the percussion wave was less pronounced. Transverse cardiac dulness not appreciably altered after bath, and certainly not diminished.

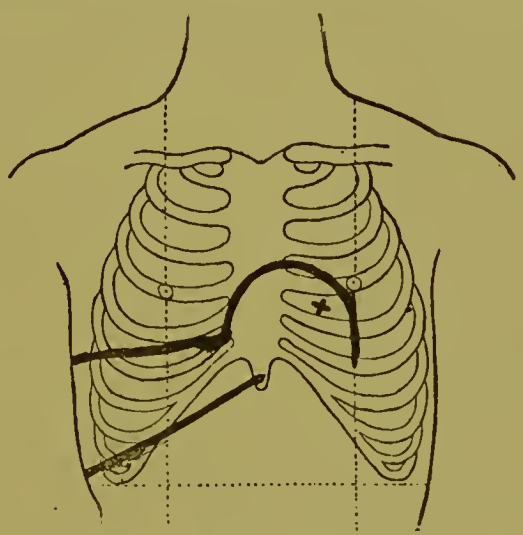


FIG. 12.—Annie J. (Case II). Before and after saline bath.

5th January, 1896.—On the day of the bath, but before it was given, she had complained of some pain in the left wrist, not very acute, and rather of the nature of a soreness, not preventing her using the hand. It was, however, wrapped up on account of this. Yesterday at dinner Nurse Keillor observed that she had some difficulty in holding her bowl of soup, jerky movements of the arm going on all the time. This morning, slight, but quite distinct, choreic movements are observed in the left hand and arm and on the left side of the face. No enlargement of spleen, or albumen in urine. She never had twitchings of her muscles before.

29th January.—Præcordial pain, particularly at night, has all along continued a prominent and distressing feature of this case; indeed, the pain, coming on as it does at more or less definite

intervals, might be denominated angina. Patient is unfit for the slightest exertion, even sewing fatiguing her in a very short time. While at rest in bed there is no obvious dyspnœa, although the patient prefers a somewhat high pillow. A pulse tracing to-day indicates marked dicrotism, and the rate at the time of tracing is 116; an hour after, 112. The temperature throughout has been normal or sub-normal, and the weekly register of weight has varied between 5 st. 5 lb. and 5 st. 10 lb., there having been, on the whole, a slight tendency to decrease of weight since the beginning of January, but the difference is by no means great.

The urine, on the whole, has maintained an average daily quantity and specific gravity, and upon only two occasions in the course of twenty-six examinations has a slight trace of albumen been recorded. Chorea has quite gone, and no complaint of joint pain has been made for some weeks.

The physical examination of heart to-day gives the following results:—Apex beat most punctuate in fourth intercostal space about 3 in. from the middle line, and is preceded by a slight, though quite perceptible, thrill. In the second left interspace another pulsation is visible, to the fingers quite clicking in character, and alternating with the apex beat.

The extremely emaciated condition of the chest wall renders the pulsating areas easily visible. The right border of cardiac dulness is $\frac{3}{4}$ in. to right of middle line, the upper touches the third rib, and the total transverse measurement is $3\frac{3}{4}$ in.

On auscultation over the apex, the most prominent murmur is V.S. in rhythm. In addition, however, a murmur is also detected in

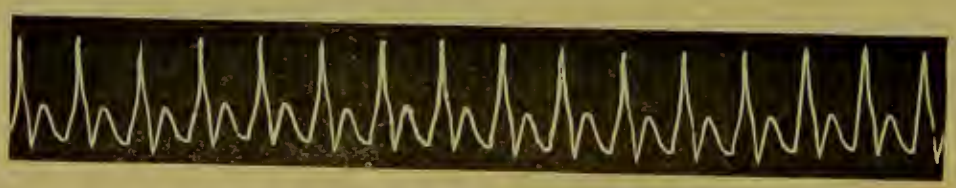


Fig. 13.—Annie J. (Case II). Tendency to hyperdicrotism.

the long pause, without, however, any of the harsh and superficial quality usually associated with a typical A.S. bruit. The second sound is markedly accentuated over the pulsating pulmonary artery. In the aortic area the cardiac sounds are heard almost pure, the V.S. murmur being conveyed to the ear, however. In this area, also, at

the end of inspiration a distinct friction sound is heard, but whether pericardial or pleural is not determined.

20th March.—Patient goes to the Convalescent Home to-day, her general state, if anything, better; still liable to nocturnal præcordial

Fig. 14.—Annie J. (Case II). On dismissal to Convalescent Home.

pain. Cardiac dulness 5 in. across, reaching on its right side $\frac{3}{4}$ in. to right of mid-sternum and the third rib above. Apex beat is difficult to localise on account of the generalised præcordial heaving.

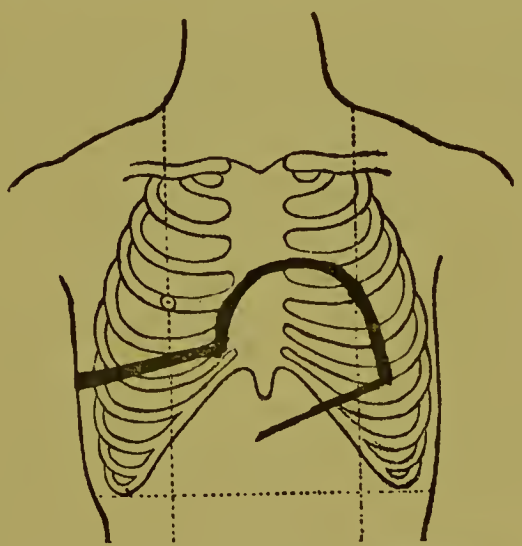


Fig. 15.—Annie J. (Case II). On dismission.

In this case, one of the most troublesome symptoms was cardialgia, always most severe at night, and frequently assuming characters suggestive of genuine angina pectoris. The treatment consisted at first of the exhibition of tincture of digitalis as a cardiac tonic. The pain, however, became so bad that such drugs as phenacetin, nitrite of amyl, and nitro-glycerine were cautiously administered for its relief, most success being obtained with the last named. On the 9th of March we commenced with great care a mild course

of resisted movements. The course was discontinued upon the 19th of March, without any change of any kind having been noted as the result of it. The following table shows at a glance the details of this part of the treatment:—[1]

Date.	Duration of Exercises.	Pulse-rate.	
		Before.	After.
9th March, . . .	5 minutes.	...	...
10th ,, . . .	10 ,,	118	116
12th ,, . . .	15 ,,	120	124
16th ,, . . .	15 ,,	120	118
17th ,, . . .	5 ,,	122	124
18th ,, . . .	10 ,,	126	134
19th ,, . . .	15 ,,	120	126

Case III.—*Mitral Disease with regurgitation and great hypertrophy of heart of rheumatic origin; improvement under ordinary remedies; saline bath, with result that patient left hospital rather than submit to another.*

Agnes D., æt. 12, a schoolgirl, was admitted to Ward 8 on 9th November, 1895, suffering from breathlessness on exertion, and præcordial pain.

Up till last winter patient enjoyed fairly good health, with the exception of mild attacks of measles and scarlet fever in infancy. About January last, however, she suffered for about two months from pains in the joints of knees, elbows, wrists, ankles, and phalanges. She was not confined to bed at this time, and there does not seem to have been pyrexia during the illness, at least, not to any noticeable extent, and no breathlessness was remarked at that time.

[1] On leaving the Infirmary, Annie J. went to the Schaw Convalescent Home, Bearsden. There her symptoms soon became more urgent, dyspnœa, lividity, and dropsy becoming extreme. She died on the 20th April last, and a *post-mortem* examination was held upon the 21st. The pericardium was found to be universally adherent, the heart and pericardium together weighing 25 oz. The mitral orifice was dilated, and there was well-marked endocarditis of its curtains. The left ventricle and auricle were much dilated, and a large patch of recent endocarditis was found on the posterior and inner aspect of the internal surface of the latter.

She remained healthy until about nine weeks ago, when, after slight premonitory joint pains affecting the knees and ankles, she had a sudden severe attack of pain over the cardiac region while out with her mother. Her mother took her home at once, and she was confined to bed for some three weeks, and has for about six weeks now been going about pretty continually.

This heart pain has been unaccompanied by any oppressive palpitation, no beating over the heart having been noticed. Since its onset, nine weeks ago, great breathlessness has been experienced, especially on any exertion, such as stair climbing.

No urinary trouble. Appetite has been for some time rather poor. Bowels regular, however.

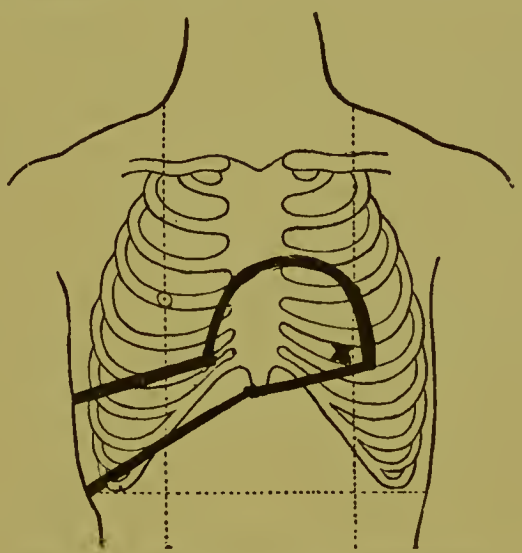


FIG. 16.—Agnes D. (Case III). On admission.

For the first three weeks of this illness, during which she was confined to bed, severe cough and copious spit were complained of, and the cough seemed to make her very breathless. She has fallen off in flesh to some extent within the past year, and now weighs 4 st. 9 lb.

Her mother is alive and strong. Her father has been ill for about a month with some disease of the kidneys. She has a brother and a sister living, the latter having at times præcordial pain. A brother and a sister died of measles, another brother was burned, and a third died of "inflammation of the bowels."

Examination on Admission.—She is very evidently weakly and delicate. Face pale, general body surface rather anæmic. The mucous membranes exhibit this well. The tongue is clean and moist. The lungs present no abnormal indications. The cardiac

dulness is much increased. Its limits are ¾ in. to right of mid-sternum, lower edge of third rib, and ¼ in. outside nipple line—total transverse measurement 4¾ in. The whole præcordial region is very evidently the seat of undue, rather tumultuous, cardiac action. The proper apex impulse is most punctuate in the fifth interspace, 3 in. out from mid-sternum, but in the fourth, third, and second and nearer the sternum, as one ascends, there is visible pulsation. On auscultation of the whole cardiac area, the sounds, although hurried and tumultuous, are free from murmur, except over the apex and within an area of about 1 in. around this, but passing out also into the axilla. The second is, if anything, rather accentuated; and over the extreme lower end of the sternum the sounds are heard quite free from murmur. No thrill is made out on palpation. The liver measurements are 3½ in. in mid-axillary line, 3 in. in nipple line, and in mid-sternal line the dulness is carried up right into the cardiac dulness. There is no hepatic tenderness, no œdema of legs, &c. Pulse weak, of low tension, and regular in rhythm, 120 per minute.

27th November.—Little change of note falls to be recorded since admission. The course of the case has been quite apyretic, and there has been no complaint of joint pains or of breathlessness. The bowels have been, on the whole, loose to the extent of two or three motions daily, and the appetite has been very poor, although sickness, which was troublesome for a few days after admission, has disappeared under lactopeptine. Beyond this the treatment has consisted entirely of rest in bed. There is no hepatic enlargement or tenderness, and the lungs present throughout normal characters. The area of cardiac dulness is practically quite as at last note, measuring 4¾ in. across, the right border being almost an inch to right of middle line, the upper at the middle of the third cartilage. The apex impulse is as before noted, and no change in the condition of the murmur can be made out.

To-night over the pulmonic area, however, a reduplication of the second sound is noted. The pulse is very small, numbering 100, but quite regular in rhythm. Respirations are 28, and in no sense laboured, the patient lying flat down in bed with comfort.

16th December.—The only thing to be noted to-day about the cardiac examination is that the mapping out of the cardiac dulness makes the total transverse measurement at most 4¼ in.; otherwise the physical signs are much as at previous note.

28th December.—In view of the saline bath, the following points of physical examination are made out at 10·30 A.M. Pulse is 100 per minute, is small and compressible, and, as shown by the sphygmograph, distinctly dicrotic, with a predicrotic wave. This observation taken in bed. In the upright posture, after walking to the end of the ward, pulse numbers 120. No change in the area of cardiac dulness to be made out since last note, the measurement being $4\frac{1}{4}$ in. in greatest transverse diameter, the outline being as in the diagram below. The apex beat is most punctuate in the fourth interspace, although still distinctly visible in the fifth. There is still pulsation visible in the second, third, fourth, and fifth interspaces; but, on the whole, less tumultuous

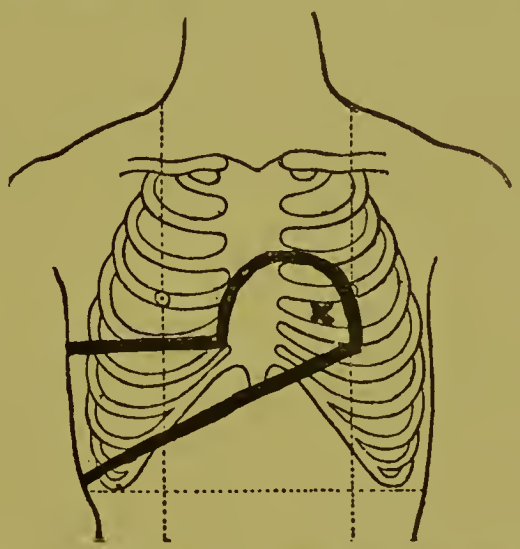


FIG. 17.—Agnes D. (Case III). Before and after saline bath.

and forcible than before. Owing to the diffuse character of pulsation, it is difficult to measure the distance of a punctuate apex impulse from the middle line; but both in fourth and fifth spaces it is well within the left border of cardiac dulness.

Patient entered bath at 10·32 A.M., and left it at 10·39 (seven minutes). Walked to bed. At 10·41 A.M. the pulse, taken in recumbent posture, numbered 106, and to finger had much the same characters as before.

Ten minutes after leaving bath a sphygmogram at same pressure as previously was taken, the only difference between the two sphygmograms being a distinctly stronger upstroke; otherwise the features are the same. Percussion of the heart is carried out at 10·55 A.M., and the most careful attempts by Dr. Steven, Dr. Young, and

Miss Hannay (medical student) fail to detect any difference in cardiac area, which remains the same as shown in the diagram.

It is to be noted, also, that the immediate effect upon the pulse, *i.e.*, within five minutes of the bath, was to weaken it, as at first great difficulty was experienced in getting the needle of the sphygmograph to move.

Dismissed 3rd January, 1896, much improved.

The effect of the bath on this girl, for some reason or other, was such that she gave her parents no rest until they removed her from the hospital. She complained of feeling sick after it, but there was no objective evidence of this. For the rest the treatment consisted of absolute rest in bed; and from the 28th of November she received, thrice daily, a mixture containing small doses of tincture of strophanthus, liquor arsenicalis, and tincture of nux vomica. We attributed the improvement in the condition of the heart to the prolonged rest in bed.

In proceeding on the basis of the foregoing cases to make a few remarks upon the value of the Schott methods of treatment, I desire to make it plain that my remarks are entirely limited to a discussion of the Nauheim method as applied to the treatment of rheumatic valvular heart disease, in which compensation has commenced to give way, or has more or less completely failed. Of the influence of the Schott treatment on any other varieties of disease—cardiac or other—I have as yet no experience, and shall say nothing. Into a discussion of the theory underlying the method of treatment by baths and exercises I shall not enter. I have no special theory to support, or, of my own, to offer; and for information as to the theoretical speculations of others I content myself by referring you to Dr. Saundby's paper already mentioned, and to the paper of Dr. R. F. C. Leith, published in the *Lancet*, 21st and 28th March, 1896, to each of which lengthy bibliographical lists are appended.

It may possibly be urged by those who have practised the Nauheim system most assiduously that my method of procedure

in carrying out the treatment has been faulty. To this I have only to say that I was feeling my way as carefully as possible,

TABLE SHOWING THE EFFECTS OF SALINE BATHS UPON THE PULSE-RATE OF ANNIE M'D. (CASE I).

Date.	Time in Bath.	Temp. of Bath.	Pulse-rate				Remarks.
			Before Bath.	During Bath.	After Bath.	Half hour after Bath.	
1896.							
Jan. 31	6 min.	96° F.	92	...	100	...	*No. 1 bath.*
Feb. 1	,,	,,	100	...	98	...	
,, 7	,,	,,	96	96	90	89	Intermitted owing to menstruation.
,, 8	,,		88	92	82	82	*11th.* — Swedish exercises begun, and continued 5 days weekly.
,, 11							
,, 12	7 min.	,,	82	92	84	...	*No. 2 bath commenced.*
,, 13	,,	,,	85	92	85	81	
,, 15	,,	,,	80	88	84	80	
,, 16	,,	,,	76	84	82	80	
,, 17							[in knee.
,, 18	,,	95° F.	84	88	76	78	No bath; sore throat; pain *No. 3 bath commenced.*
,, 20	,,	,,	82	86	88	79	
,, 21	,,	,,	80	84	74	80	
,, 24	10 min.	,,	90	93	78	87	*No. 4 bath commenced.*
,, 25	,,	,,	84	93	86	88	Pulse every 3 minutes in
,, 26	,,	,,	74	91	82	79	bath, 90, 93, 94.
,, 27	,,	,,	98	90	90	84	
,, 28	,,	,,	84	94	90	82	
,, 29	,,	,,	82	97	85	84	
Mar. 2	,,	,,	85	96	84	84	
,, 3	,,	,,	84	82	96	86	Skin slightly pink.
,, 4	,,	,,	78	88	82	96	Skin slightly pink.
,, 5	,,	,,	96	100	92	102	Skin decidedly pink all over.
,, 6	,,	,,	92	114	112	94	Skin pink.
,, 7	,,	,,	88	88	98	86	
,, 9	,,	94° F.	76	91	84	92	*No. 5 bath commenced.*
,, 10	,,	,,	92	92	86	80	Skin red.
,, 12	,,	93° F.	76	80	90	74	
,, 13	,,	,,	84	92	86	94	
,, 14	,,	92° F.	92	92	94	98	
,, 19	,,	91° F.	102	94	104	116	
,, 20	,,	90° F.	90	88	98	100	
,, 23	,,	89° F.	84	84	80	80	Pinkness of skin not at all
,, 24	,,	88° F.	86	84	80	82	very marked, and after
,, 26	,,	87° F.	84	86	84	80	6 minutes quite pale.

actuated solely by a desire to do the best I could for the patients, and that the details of the whole procedure have been laid before you. In the case of Annie M'D. the course of

treatment may perhaps have been too rapidly and vigorously carried through. The case of Annie J. may have been entirely unsuitable for it—indeed, I now think that it was. Agnes D. may not have required the treatment at all, and certainly her own impression was to this effect. I was careful, however, to watch that no appreciable harm was being done, and that being so, I can simply base my opinion on the results of the treatment as it was carried out.

In the first place, I have to remark that I have been quite unable to obtain any of the striking changes in the condition of the pulse, or of the area of cardiac dulness, which have been recorded by many observers in terms which were bound at once to rivet the attention of everyone accustomed to make frequent physical examinations of the circulatory system.

The series of observations on the pulse-rate of Annie M'D., as affected by the saline baths, and shown in detail in the accompanying table (p. 49), may be summarised as follows:—

1. *During the bath*—

Pulse-rate accelerated, ...	21 times.
Do. unaltered, ...	5 times.
Do. retarded, ...	5 times.
	In 31 observations.

2. *Immediately after the bath*—

Pulse-rate accelerated, ...	19 times.
Do. unaltered, ...	2 times.
Do. retarded, ...	12 times.
	In 33 observations.

3. *Half an hour after the bath*—

Pulse-rate accelerated, ...	13 times.
Do. unaltered, ...	2 times.
Do. retarded, ...	15 times.
	In 30 observations.

If we take the immediate and the remote effects of the bath upon the pulse-rate together, we find—

4. Pulse-rate accelerated, ...	53 times.
Do. unaltered, ...	9 times.
Do. retarded, ...	32 times.
	In 94 observations.

It is to be noted that the pulse-rate was always taken in the recumbent posture, in the bath and out of it; and it will at once be seen that, as regards the rapidity of the pulse, this case followed no general rule. Indeed, taken over all, the pulse-rate was accelerated and not retarded as the effect of the saline baths. In the cases of Annie J. and Agnes D. we could only observe the effects of one saline bath. In both the pulse-rate was accelerated by a few beats after the bath. So far, then, as our observations go, there is no notable slowing of the pulse to be recorded as the immediate or remote result of the baths in our cases, and this is certainly contrary to the experience usually recorded.

As regards the other characters of the pulse, they were investigated both by the finger and the sphygmograph, and certainly by neither method could any very striking alterations be made out as the result of the baths, either immediately or remotely. I show you a large number of pulse tracings, and you will note that, on the whole, but little change in the character of the pulse is recorded from the beginning to the end of the treatment. Sometimes the tension, as indicated by the tracing, is slightly increased; at others slightly diminished.

The influence of the resisted movements on the rate of the pulse was not so fully studied. In the case of Annie M'D. the pulse-rate was, on the whole, slightly retarded; in the case of Annie J. slightly accelerated, as the result of the movements.

I have never been able to satisfy myself of the presence, as the result of the baths, of those striking alterations in the area of cardiac dulness which have been described by Schott, Bezly Thorne, Saundby, and others; and I am quite sure that the position of the apex beat was never altered as the immediate result of a bath. I think it quite impossible to place any reliance upon the mere variation of the margin of

cardiac dulness as an indication of change in the size of the heart. Of this I am certain, that any slight diminution in the area of cardiac dulness which I may have been able to make out in the case of Annie M'D. after a bath—and I did note an alteration in the left border on one or two occasions—was much more likely to have been due to changes in the volume of the stomach or lungs than to any shrinking of the cardiac wall. And this was borne out by the circumstance that the position of the apex beat remained the same.

In conclusion, I have now briefly to consider the value of

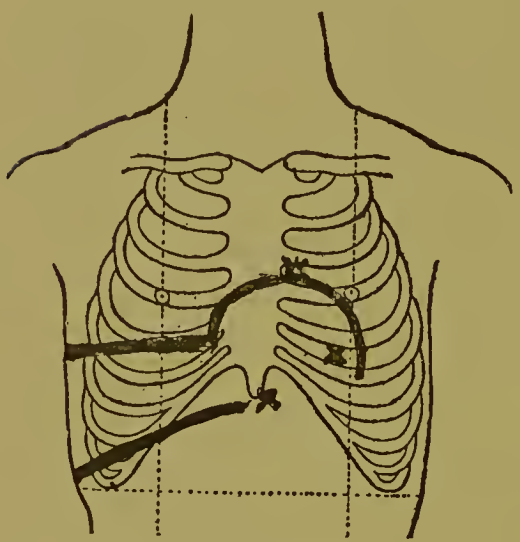


FIG. 18.—M. M'I. (not described in detail). Treated by rest. On admission.

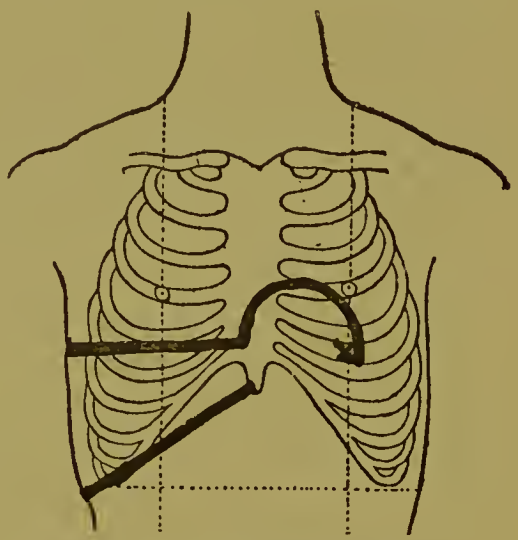


FIG. 19.—M. M'I. (not described in detail). Treated by rest. On dismission.

the Schott method as a therapeutic agent in the treatment and cure of valvular disease of the heart of rheumatic origin. It is always to be remembered that we can only make use of the term *cure* as applied to valvular disease of the heart in a very limited sense. In most of these cases the cure consists not in a restoration of the diseased valve to a normal condition, but in the establishment and maintenance of a condition of compensation. In this sense we can, and frequently do, cure our cases of valvular disease, and may keep our patients in a state of comparatively good health for long periods of time. We have to enquire, then, what is the value of the Schott method of treatment in the cure of heart disease, and how

it compares with other and longer established therapeutic measures. In answer to this question I have to say that I do not think we can accomplish, in the class of cases under consideration, anything by the Schott method that we cannot effect quite as easily, and often much more safely, by the old-fashioned plans of treatment. In the wards, along with the patients who were treated by the Nauheim system, we had a number of other cases of valvular heart disease, which were treated by prolonged rest in bed, careful dieting, and, when necessary, by the cautious exhibition of cardiac tonics. In some of those I was able to demonstrate to you even greater improvement than could be shown in the cases in which the Schott plan was tried. The area of cardiac dulness was diminished to a greater extent, the apex beat was brought nearer to the middle line, and the symptoms referrible to the heart were more effectively relieved. In illustration of this I show you these tracings from another case of mitral disease which we have frequently examined together, and which was treated chiefly by rest in bed (see Figs. 18 and 19).

I go further, however, than this, and I say that in many cases of rheumatic valve disease the Schott system is a dangerous method of treatment. I have heard an enthusiastic advocate of its merits say that it "*brings out the rheumatism,*" and in one of our cases it brought out chorea as well. Now, I have no desire to bring out the rheumatism in treating my cases of cardiac valve disease, and I would advise you never to apply the Schott methods in the early stages of heart disease after rheumatism. You will accomplish far more by prolonged rest and careful dieting. Never mind about bringing out the rheumatism.

But I do not wish you to go away with the impression that there is no value in the Schott system. The tone of many of the papers in which its merits have been proclaimed would almost lead us to believe that it was being put forward as a specific in heart disease, capable of producing beneficial results to be obtained in no other way. This I do not believe, and I think that this manner of presenting the case for the Nauheim system is tending to blind physicians to its real

value. Its essential value lies in the demonstration it has given that moderate and carefully regulated exercise is not a bad thing in the treatment of many cases of chronic valvular disease, and the attention it has lately excited has done much to remove the perhaps too prevalent impression that rest, and rest only, is the proper method of dealing with disease of the heart. But this is no new thing, and was plain to Oertel and many others long before the Bad Nauheim was so much spoken about. We have now come to see that when acute endocarditis has subsided, and we are dealing with a crippled valve in which all acute processes have ceased, everything that will maintain a high level of bodily health and muscular tone will have a good effect upon the heart, and enable compensation to be maintained. From this point of view, and with this object before us, we may find the Nauheim system, very carefully applied, of some value in a number of cases of cardiac valve disease. Beyond this I think it can have little effect, and as a *specific* in the treatment of heart disease of the kind we have been studying in this lecture, it is of no value whatever—it is useless.

LECTURE IV.

ON A SERIES OF CASES ILLUSTRATING THE INFLUENCE OF SYPHILIS IN THE SUDDEN PRODUCTION OF ALARMING DISORDERS OF THE NERVOUS SYSTEM.[1]

THE relationship existing between syphilis and lesions of the central nervous system has always been an interesting subject of study for the physician. As to the influence of syphilis in the production of what are usually called the chronic degenerative diseases of the cerebro-spinal system, much speculation has been indulged in, and great difference of opinion has prevailed. I do not, however, in this lecture intend to deal with this very interesting and important aspect of the neuro-pathology of syphilis. My object, on the contrary, is to bring under your notice a series of cases in which syphilis may be supposed to have been instrumental in determining the onset of more or less sudden attacks of nervous disease, with the somewhat rapid development of motor, sensory, or convulsive disturbance, and comparable in some measure to those conditions which we know to be produced by hæmorrhagic effusion or acute inflammation, and which in ordinary language are frequently denominated "shocks," "fits," or "strokes." That syphilis may so act upon the central nervous system is undoubted, and upon the early recognition of the syphilitic origin of the malady much

[1] This lecture was not delivered in the form in which it is now printed. The cases described in it were demonstrated in detail at three different meetings of the clinical class, and the remarks made on these occasions are now embodied in one lecture. For the reports of the cases I am indebted to my Resident Physician, Mr. Archd. Young, M.B., B.Sc.

of our success in the treatment of such cases depends. On the whole, it may probably be admitted that syphilitic affections of the nervous system are more insidious in their mode of onset than either hæmorrhagic or acute inflammatory diseases, but sometimes a syphilitic lesion of the brain or spinal cord may be as rapid in its development as the most characteristic cerebral hæmorrhage or acute myelitis.

Acute or sub-acute attacks of paralysis or convulsions due to syphilis may be brought about chiefly in one of two ways: (1) by the rapid development of a gummatous nodule; or (2) by the production of a syphilitic thrombosis suddenly depriving a larger or smaller area of nervous tissue of its necessary blood supply. Such results of the presence of syphilis are usually met with during the tertiary stage of the disease—that is to say they are late phenomena, often occurring long after the original infection of the system, and thus we often fail to get from the patient any corroborative history, or, from physical examination, any further evidence of the presence of syphilis. We should never, however, upon negative evidence of this kind alone, exclude syphilis as an etiological factor in the consideration of cases of "shocks" or "fits," unless we have positive proof of some other morbid condition as a causal agent.

The most profound paralyses, the most agonising headaches, the most alarming epileptiform seizures, and the most marked forms of aphasia may all be produced through the agency of syphilis, and under such circumstances the success often attending a vigorous course of antisyphilitic treatment is one of the most encouraging things in the practice of medicine. In illustration of the foregoing remarks, I propose now to bring under your notice in detail the following cases, three of which you have seen from day to day in the wards in the course of our regular visits. The fourth case of headache and epileptic convulsions due to syphilis, in which the results of antisyphilitic treatment were very striking and most encouraging, occurred a number of years ago in my practice in the out-patient room of the Glasgow Royal Infirmary. The first of these may be summarised as follows:—

CASE I.—*Syphilitic Hemiplegia probably of gummatous rather than of thrombotic origin; Jacksonian fits at onset of illness; coincident gummatous tumour of scalp; rapid recovery under mercury and iodide of potassium.*[1]

Duncan W., æt. 46, married, a coppersmith, was admitted to Ward 7 on the 19th October, 1895, complaining of paralysis of the left arm and leg of about a fortnight's duration, and of having had three convulsion fits.

Great difficulty is experienced in interrogating this man, not so much from apparent deafness on his part as from a want of intelligence or capacity for picking up ideas quickly. Often quite different answers are given to the same question. However, the following is something like his story. With the exception of minor ailments, he maintained good health until about eight years ago, when he had an illness characterised by swelling of the legs and face, which was termed Bright's disease. For this he was treated in Professor M'Call Anderson's wards in the Western Infirmary, where he remained for six weeks. On dismission from the Western Infirmary he was, he thinks, in good health, and remained so until about four years ago, when he had what he describes as a "slight shock," similar, he thinks, to his present trouble, but which only affected his right leg and very slightly his arm, if at all. He was then in this Infirmary, in the wards of Dr. Samson Gemmell, but under Dr. Lindsay Steven's care, for several weeks, and left much improved, soon recovering the use of his limbs entirely. He was on this occasion treated by 20-gr. doses of iodide of potassium thrice daily.

His present illness began about a fortnight ago, when he was at Barrow. On Wednesday, the 9th October, he found that his left leg and left arm were gradually but surely losing their normal power, the hand, for example, beginning to get quite useless for holding his tools at his work. He had to stop work, and from that time his symptoms increased in severity until about a week before admission, when he returned to Glasgow.

[1] This case was made the subject of clinical demonstration on 21st November, 1895.

On the forenoon of Sunday, the 14th October, while in bed he suddenly felt a peculiar sensation in his left arm and leg, and almost immediately both began to twitch, flexion and extension at elbow and knee-joints being rapidly performed. This he could not control in the slightest degree, and he had to ask his friends to hold his leg down. For a few minutes this lasted, and in the evening it again returned, this time with perhaps a more noticeable premonitory sensation, but the latter still of a very indefinite type. Next morning the same thing recurred and lasted about the same time, in each case only a few minutes being occupied. Since this no further recurrence has taken place.

Within the past twelve months he has suffered from a number of growths upon the scalp, and he attended Dr. John Wright, of Anderston, for advice regarding them. Under treatment (apparently of an antispecific nature) they have always disappeared; one, however, was opened by Dr. Wright, but did not heal very rapidly, until recourse was had to anti-syphilitic remedies, when healthy action at once set in. He emphatically denies any possibility of his having had syphilis, but admits that he has frequently been where such was and might have been contracted. He has never had rheumatism; has never had any subjective trouble with his urine; and has been given to alcohol to a pretty marked extent.

His eyesight has failed of late, in the way of interfering with his seeing well to read small print. No incontinence of bladder or bowels is known of. No stomach trouble of any kind has ever been experienced; and he has never suffered from headache.

The patient is a strongly built man. His face is rather like that of an alcoholic subject, and he has a dusky earthy complexion, the skin generally presenting an oily appearance from excess of sebaceous secretion. The temporal arteries are very tortuous and somewhat rigid. The eyes are alike and not visibly abnormal, either as regards the pupils, ocular movements, or mobility of the eyelids.

On the whole there is a tendency for the mouth to be drawn to the left side, but little definite can be said on this

point. Pursing of the lips, whistling, &c., are quite adequately performed. Speech is a little hesitating and thick, but the trouble seems to be due, on the whole, to generally dull intelligenec. The tongue is foul, and on protrusion shows a very distinct tremor of a fibrillary, and at times, in addition, of a wavy, jerky type. No deviation to one side is notieeable.

The eardiae system is not appreeiably abnormal or ealling for note, save that the second aortic sound is very pronouneedly slapping in eharacter and that the outer edge of the eardiac dulness is not definitely pereussible, most probably by reason of overlapping of emphysematous lung, the apex beat not being visible or tangible, and not even loealisable easily to a given spot by auseultatory examination. The pulse is of fair strength and regular in foree and rhythm; the radial arteries are somewhat rigid.

The lungs present pretty marked emphysematous charaeters, and the respiratory murmur is enfeebled very deeidedly over the posterior and lower aspeets of the chest, no differenee in the respiratory murmur of the two sides being notieed however. A eonsiderable amount of wheezing aeeompanies the breath sounds at all points of the chest surface; the percussion note is everywhere hypersonant; and the movements of the chest, exeept on deep inspirations, are very feeble and of little amplitude. The ehest, it should be noted also, has an unmistakable barrel-shape.

The liver dulness is normal in situation and apparently not unusually large in size or the opposite. No hepatic or other abdominal tenderness on palpation is made out.

The arms are eompared as regards their power. The right is apparently normal, but the left is incapable of flexion at the elbow by voluntary effort. The left fingers cannot be extended while the wrist is so, but on flexing the latter the extension movements ean be effeeted in some measure. Flexion of the fingers is quite easily accomplished. The grasp of the two hands is very different in power, the left being very feeble as compared with the right The arm ean only be very slightly raised as a whole, simply off the support for a second or so, and then falls back. The left leg can only be slightly

moved, and very little power remains to accomplish flexion at the knee. Clonus is very easily elicited in the left leg, and the knee-jerk is undoubtedly exaggerated on this side, although as regards the other leg it has to be stated that here also the knee-jerk is very easily demonstrated.

The plantar reflex is less marked on the left than on the right side. Sensation on the left side as a whole is little impaired, but there is undoubted delay in the transmission of the sensory impulses from the lower extremity, and there is a want of delicacy in perception of the differences of heat and cold. The sense of pain, however, does not seem to be impaired. Hearing is unimpaired.

A somewhat hard but rather elastic swelling, the size of a large hazel-nut, is felt over the right side of the fronto-parietal suture, about 1 inch from the middle line.

The urine is not appreciably abnormal in character.

On the 21st October I entered the following note in the Ward Journal:—

In the case of the arm, it is perfectly clear that the extensor muscles of the elbow and hand are chiefly affected, so much so that a more or less tonic spasm of the flexors is found to be present, leading to the arm assuming a semi-flexed position. On attempting to walk, for which he requires much help, a pretty profound paralysis of the left lower limb shows itself, and here it is obvious that the peroneal muscles are more involved than the others, so that when he swings round the left leg in walking the foot drops, and the backs of the toes are liable to be drawn along the ground.

On the same day I ordered the following treatment to be commenced:—

℞.—Unguenti hydrargyri, ... 2 oz.

Sig.—A piece of the ointment the size of a horse-bean to be rubbed into a soft part of the skin once daily.

℞.—Potas. iodidi, ... 2 dr.
Syrupi Aurantii, ... 1 oz.
Aquam, ... ad. 6 oz.

Sig.—A tablespoonful thrice daily.

For a week or ten days after admission no improvement could be observed, indeed, it was thought that on the whole he was worse. His intellect seemed to be somewhat clouded, and on one or two occasions during the night, having attempted apparently to get out of bed, he was found lying on the floor, quite unable to help himself in any way. The hemiplegia also during this period was decidedly worse than on admission, so that for a time he entirely lost the power of locomotion.

On the 21st November I brought this case formally under your notice at one of our clinical demonstrations, and we then found that very great improvement in all his symptoms had taken place. The gummatous tumour of the scalp had quite disappeared, so that even its precise situation could no longer be localised. The lethargy and intellectual dulness, so striking on admission, had given place to a much brighter mental state. The left arm could be moved freely in all directions, and the hand opened and closed with ease, although its grasp was still weaker than the right, the dynamometer giving 17 kilos. with the left, and 27 kilos. with the right. Sensation in the arm was normal, and he touched without difficulty various points of the face with his eyes closed. The condition of the leg was also greatly improved. The peroneal paralysis had almost entirely disappeared, and he was able to walk with the aid of a stick only. Sensation was normal in both legs, but patellar reflexes were exaggerated in both, and ankle clonus could be developed in both; very slightly in the right, markedly in the left. His general condition was very good.

On the 19th December the following note was entered in the Ward Journal, and it may now be quoted as showing the improvement after nearly two months' treatment in hospital:—

The mercurial treatment in this case has been suspended since Sunday, the 8th December, on account of complaint of the teeth becoming loose. As to the great improvement in the paralytic condition there can be no doubt. He is now able to walk quite easily without the aid of a stick, although the gait is somewhat stiff and he tends to put down his heels first. He stands easily with his feet close together and his eyes shut.

Patellar reflexes are exaggerated in both legs. Extreme

ankle clonus is easily developed in the left, but is not nearly so markedly present in the right lower limb.

The right hand with the dynamometer registers 26 kilos.; the left, 23 kilos.

Notwithstanding the improvement in muscular power, he has all along complained, and still complains, of a pricking sensation involving the whole left arm from the shoulder to the wrist. This symptom is not complained of in the left leg. Sensation is normal in the lower limbs as regards touch, pain, temperature, and locality. On testing the surface of the legs with the æsthesiometer, it is found that a relatively greater distance is required for the recognition of two points than in a man not suffering from nervous complaints.

The temperature has been normal or sub-normal throughout. The mercurial treatment is resumed to-day.

On the 3rd January, 1896, he was dismissed from the wards well, and about two months after this he called to report himself as still keeping well and quite free from his paralysis.

As to the syphilitic nature of the lesion in this case I think there can be no reasonable doubt, notwithstanding the denial of the patient as to the possibility of his ever having had syphilis. The earthy complexion, the succession of gummatous tumours on the scalp, the Jacksonian epilepsy, and the rapid relief of all the symptoms under mercurial treatment, all point to syphilis as the primary cause of this man's disease. As to the precise nature of the syphilitic lesion all the indications are in favour of a gummatous formation involving the motor area of the surface of the right cerebral hemisphere, rather than of thrombosis. We would have expected a thrombotic lesion to have developed paralysis on the whole more suddenly, and it would not have been so likely to have produced Jacksonian fits, such lesions being more common in the interior than on the surface of the brain. It may be doubted also whether recovery would have been so perfect in the case of thrombosis, unless, indeed, it had been possible by means of very prompt and vigorous treatment to restore the cerebral circulation at a very early period of the case. A gummatous infiltration, on the other hand, would not

so soon bring about the complete destruction of the cerebral tissue into which it took place, and being checked in its growth and ultimately completely removed by appropriate treatment, would be more likely to leave the cerebral elements in almost their normal state. Again, a gumma usually develops on the surface of the brain or on its membranes, rather than in the interior of the organ, and the symptoms in the case of D. W. pointed, on the whole, to a surface lesion. And, lastly, with a succession of gummatous tumours of the scalp, it is not at all unlikely that similar developments might occur within the skull.

I shall now describe to you a case in which the paralytic phenomena were practically confined to the muscles of the eyeball supplied by the third cranial nerve.

CASE II.—*Third-nerve paralysis of syphilitic origin, with complete ptosis and loss of power in all the ocular muscles except the external rectus; severe hemicrania, nocturnal in character; history of antecedent "faint turns" or "shocks;" aortic valve disease; complete recovery from hemicrania and ophthalmoplegia under mercury and iodide of potassium.*[1]

Mrs. P., æt. 53, outside worker, was admitted to Ward 8, on the 18th October, 1895, recommended by Dr. T. K. Monro from the Dispensary. Her chief complaint on admission was of inability to open the right eye, and severe frontal headache limited very definitely to the right side.

After suffering from the ordinary infantile ailments, she maintained good average health all through her life. She was in hospital about twenty years ago, suffering from the effects of a fall from a height of three storeys. She seems to have sustained little harm at this time, however, as she was able to resume her ordinary work in about a fortnight.

She has been married for about seventeen years; previous to this she had had four children, of whom one died in infancy, one was born dead, and the other two survive and are in good health. Since her marriage she has had no children and has

[1] This case was made the subject of clinical demonstration on 19th November, 1896.

had no miscarriages. Her husband, she states, is in good health, and she thinks the father of her children was also in good health. No venereal disease, so far as she knows, ever affected either her husband or herself, and no evidence of specific disease can be got on careful questioning.

About six months ago, while returning from her work, she took what she described as a "faint turn." She repaired to a neighbouring public-house, and had a glass of spirits, but thereafter fell down unconscious. She remained in this state for about three quarters of an hour, and was then able, with a little assistance, to make her way home. Later on in the evening, she was so far recovered that she was able to go out alone to do shopping. She kept well for about two months after this illness, when she had a second attack similar to the first in its onset and duration, but it is to be noted that, according to a neighbour's statement, the left side and left extremities shook violently throughout this seizure. Since the first attack she has experienced headache of a somewhat severe and constant character, and very definitely localised to the right frontal and parietal regions. Within the past few weeks, however, the pain began to shoot into the ear, and at times into the orbit, causing, she thought, a loss of power over the ocular movements of gradual onset. Last Tuesday (15th October), however, the pain in the orbit was more severe, and she found her upper right eyelid drooping slightly. On Wednesday morning she could not open the eye at all, and lachrymation was very marked.

She has never had acute rheumatism, but at times has suffered from pains in the knee-joints which she herself called rheumatic. Her bowels have always been so costive as to require regular medicinal aperients. She has suffered much from piles from time to time. There has been no urinary trouble, and there is no history of breathlessness or palpitation. She has suffered occasionally from pyrosis, but it must be noted, too, that she is a constant drinker of some form of alcoholic liquor, and has been in the habit of having a glass or two daily on her way home from work.

Her father died of some kind of fever; her mother of a

"shock." Her brothers and sisters enjoy good health. The "faint turns," as she termed them at one time, she also spoke of as "shocks."

The patient presents a somewhat striking appearance on account of the complete closure of the right eye. On opening

Fig. 20.

Showing the complete ptosis of the right eyelid present on admission, 11th October, 1895. (*From a photograph by Mr. Archd. Young, B.Sc., M.B.*)

the lids it is found that the eyeball seems to be prominent and that there is distinct lachrymation. The pupil is somewhat contracted, but, within small limits, is mobile, not dilating to any extent however, or so readily as the left pupil. The movements of the right eye upwards, inwards, and downwards are all defective, and with difficulty seen in even the slightest degree, but the eye turns outwards pretty readily. The eyelid

eannot be raised by any effort of will, and even the finger has difficulty in keeping it raised, apparently on aecount of a degree of photophobia. No sign of faeial paralysis is visible, the orbieularis palpebrarum on eaeh side eontraeting vigorously.

The lungs present no abnormality of note. The eardiae dulness measures 6 in. aeross at its greatest transverse measurement, its inner limit being at mid-sternum, its upper indefinitely made out, its outer about 6 in. out from middle line. The apex beat is both visible and tangible, on drawing the breast upwards, in the fourth interspaee, about $5\frac{1}{2}$ in. out. Over the apex a long, soft, blowing murmur is heard with the first sound, and the seeond sound also is heard to be impure. As one passes in and up towards the aortie eartilage both murmurs remain perfeetly audible, and it is diffieult to determine whether the V.S. is more probably mitral or aortie. At times the V.D. seems almost to run on into the first sound through the long pause. There is no pulsation in the epigastrium or in the neek veins. The pulse numbers 68, and is rather small but of fair tension and regular in rhythm.

The liver dulness is somewhat diminished, measuring 1, $2\frac{3}{4}$, and $3\frac{1}{2}$ in. in the mid-sternal, nipple, and mid-axillary lines respectively. There is no hepatie or other abdominal tenderness. The urine eontained no albumen.

19th October, 1895.—Little further is noted on a eareful investigation into the nervous system generally. The reflexes, deep and superfieial, are normal. No disturbanee of sensation ean be remarked over the body at any part; on the faee taetile sensation is equal and effieient on both sides, and there does not seem to be any delay in appreeiation of sensory impulses. The power of the hands, arms, and legs is good. Diplopia is eomplained of to some extent when the right eyelid is raised, but marked photophobia interferes with a thorough investigation into the optical eonditions. It is noted, however, that the diplopia is very marked when, with both eyes kept open, she is requested to look down at an object beneath the level of the horizontal oeular axis. The right pupil is still found to be kept in a somewhat eontraeted state, and only rarely does any dilatation show itself, and then only very slight in

degree. As far as can be seen, the slight reaction of the pupil is got by light stimuli, aeeommodation apparently not being carried out by the pupil.

She states that she was troubled by double vision for a day or two before she noticed the ptosis, and it was quite pronounced on the Tuesday, the day before the eomplete ptosis was remarked.

She has pretty acute sense of hearing, not manifestly different on the two sides. Percussion of the sealp reveals the presenee of very distinet pain over the right parietal region, somewhat diffuse, however, in area, and not definitely limited to any partieular spot.

The tongue is coated with a silvery white fur, the edges are indented by the teeth, and there is marked tremor.

On the 21st Oetober I ordered 1 dr. of mereurial ointment to be rubbed into a soft part of the skin once daily, and, in addition, that she should have internally 10 grs. of iodide of potassium three times a day. In addition to this constitutional treatment, it was found neeessary to have recourse to the free use of bromide of potassium, phenaeetin, and oeeasional large opiates for the relief of the right-sided headaehe, which for the first eight or ten days of residenee was very severe at night, preventing sleep. The noeturnal eharaeter of the headache was a very striking symptom.

On the 8th November I entered the following note in the Journal:—Improvement in various respects falls to be recorded. Within the past few days slight power of elevating the eyelid has returned, and the photophobia is not now so prominent. On testing the oeular museles, the external reetus is the only one that aets vigorously; the eyeball can also be slightly turned downwards, but there is absolutely no movement towards the middle line. The pupil this morning reacts both to light and accommodation, and percussion of the scalp elicits no pain.

On the 19th November the case was formally demonstrated to you at our clinical leeture on that date, when the following note of her condition was made:—On examination of the eyes to-day, the ptosis can be so far overcome that the eyelid can

be voluntarily raised to the upper margin of the pupil. The latter is medium in size, and equal to the left. It responds both to light and to accommodation; when the patient looks straight forward there is a slight but distinct divergent strabismus on the right side.

Fig. 21.

Showing slight recovery from the ptosis and divergent squint of right eye noted on 19th November, 1895. (*From a photograph by Mr. Archd. Young, B.Sc., M.B.*)

On testing the ocular muscles, the external rectus is still the only one which acts with vigour. The eyeball cannot be turned inwards past its own middle line. Very slight up and down movements may be developed, the latter distinctly the greater. Diplopia cannot now be made out. Sensation is equal on both sides of the face, the lightest touch of a camel's hair pencil and of a pin point being at once differentiated.

The right-sided frontal and parietal headache is absolutely gone, and percussion of the scalp elicits no pain. The senses of smell and taste appear to be quite normal.

From this date the improvement of the patient was quite uninterrupted, and she was dismissed on 6th January, 1896,

FIG. 22.

Showing the inability of the right eyeball to pass the middle line when the patient was instructed to look over her left shoulder. (*From a photograph by Mr. Archd. Young, B Sc., M.B.*)

with the ophthalmoplegia and ptosis quite cured. Her general health was good, and there was no complaint referrible to the cardiac condition. She was seen last about six months after leaving hospital, and there had been no return of her headache or eye troubles.

The diagnosis at which I arrived in reference to this case was that the patient was suffering from a gummatous infiltra-

tion situated at the base of the brain, in such a position as to involve the trunk of the third nerve on the right side. The completeness of the ocular paralysis pointed to involvement of the trunk rather than of the nuclei of the nerve. I also thought it not impossible, from the severe hemicrania, the tenderness on percussion of the scalp, and the history of antecedent fits, one of which affected the left side of the body, that there might have been some involvement of the motor convolutions of the right hemisphere or of the membranes covering them, not sufficient, however, to produce hemiplegia. Although no direct evidence of syphilis could be obtained, I think we may take it that all the indications were in favour of the lesion within the skull being syphilitic in nature. The social history and personal habits of the patient, the severe nocturnal hemicrania, the limitation of the paralysis to the distribution of the third nerve, and the rapid response to antisyphilitic remedies were sufficient guides to the essential nature of the case. In saying this, I am not forgetful of the presence of cardiac valve disease, or of the fact that the patient fell a height of three storeys twenty years ago; but in view of all the other circumstances I think we may neglect these in arriving at an opinion as to the primary cause of the ocular disturbances. Of course the presence of an intracranial tumour, other than a syphilitic formation, might account for all the symptoms, but upon a neoplasm, malignant or benign, antisyphilitic treatment would have had no effect.

I shall now direct your attention to a case of motor aphasia, which I believe to have been caused by the presence of the syphilitic virus in the system, but in which no appreciable beneficial effect was produced by treatment. The failure of the treatment to improve the condition of the patient might perhaps be used as an argument against the opinion that syphilis was the cause of the lesion in the brain; but I think it more likely that the initial lesion had been so severe as to cause actual destruction of nervous tissue.

CASE III.—*Aphasia, on the whole presentiug pretty typically the characteristics of the motor variety, accompanied by marked paresis and rigidity of the right arm and hand, and preceded by long continued severe headache, giving rise at one time to a suspicion of cerebral tumour; in all probability of syphilitic origin, but not benefited by treatment.*[1]

William C., aged apparently about 40, married, a labourer, was admitted to Ward 7 on 25th October, 1895, from the Dispensary, on the recommendation of Dr. A. G. Auld, suffering from a paralytic condition of the right arm and loss of the power of speech.

According to the statement of his wife, he enjoyed good health on the whole up to January last, with the exception of an affection of the nose, which set in some years ago shortly after he left the army, and which seems to have originated in a blow. He was in India while a soldier, but no history of sunstroke can be got; there being every reason to believe, however, that he suffered from syphilis while in that country.

About January last he became subject to persistent troublesome frontal headache of a very severe nature, and this never left him up to the month of March. A doctor who attended him at this time told him he suffered from a tumour of the brain. In March, about the end of the month, the date not being exactly known, he lost his speech entirely, and apparently became unconscious for a time. It is to be noted, however, that even before aphasia as such presented itself, he lost the power of expressing himself intelligibly, and was thought to have become melancholic. About 7th April he was taken into Barnhill Hospital, and a week after he was thought to have got another shock, which resulted in the loss of the power of his right arm. He was in hospital for three months, and afterwards attended Dr. A. G. Auld at the Dispensary, where he was receiving electrical treatment to

[1] This case was formally brought before the clinical class on 7th November, 1895, and contrasted with another presenting signs clearly indicating hæmorrhage as the causal factor. The cases were also utilised to illustrate the nature and varieties of aphasia, a subject not dealt with here.

his arm muscles. No incontinence of bladder or bowels has been complained of. His appetite and general health otherwise have been satisfactory for the past few months.

There is nothing of interest clinically in his family history, save that a younger brother died from a shock of some kind; and that of a family of eight born to him, two died young and one was stillborn. He wrought in the Phœnix Foundry in early life. He was a soldier for seven years, and was in India for a good part of that time; afterwards he became a labourer, and has been so now for about eight or nine years.

He has a somewhat stolid, unintelligent appearance. He is a very powerfully built man. His nose presents evidence of severe injury, distortion of shape, the right ala especially being considerably altered in form. A discharge of dirty mucus is very constantly observed running from the right nostril.

There is a considerable quantity of subcutaneous fat all over the surface of the trunk. The lungs and heart present no abnormal indications to physical examination, and the abdominal organs seem free from disease as far as can be made out; the urine also presents healthy characters. No indubitable sign of facial paralysis is evident, although the right side of the face seems rather fuller that the left.

He keeps his right arm in a somewhat rigid state, semi-flexed at the elbow and extended at the wrist, the fingers being semiflexed, but also rigid to some extent. On making voluntary movements, nothing in the nature of tremor can be made out, but there is a large swaying motion of the entire limb.

There is no apparent difficulty in standing either with or without the eyes closed, and he walks steadily along a straight line. Both legs, however, are thought to be moved in a rather stiff way, suggesting especially in the right leg a slight spastic condition. The right foot, too, is put down in a noticeably leaden stamping manner, the heel first touching the ground. The strength of the arms and legs is investigated, and distinct impairment of power is made out in the right arm. This is tested by flexion and extension of the elbow,

wrist, and fingers, the strength of both movements being estimated by the power of the patient in performing them against the resisting hand of the physician, and by his power in resisting them when attempted to be induced by the latter. The rigidity of both elbow and wrist of the right side is very evident, especially interfering with extension of the elbow-joint and flexion of the wrist, both movements if carried out by the physician causing pain.

As regards sensory phenomena, there falls to be recorded a very definite impairment of the sense of touch and pain in the right hand and arm. When asked if any sense of constriction round the trunk has been noticed a negative answer is given, and, as the question is accompanied by a gesture indicative of the phenomenon inquired into, probably the answer can be relied on.

When asked if his limbs ever felt numb or tingling, no meaning seemed to be conveyed to patient's mind; but on suggesting the query as to whether he felt "needles and pins," he immediately brightened up, and indicated the extensor aspect of the right arm at once as the seat of that sensation. It was quite evident from his gestures that he felt or had felt something of the kind.

Great difficulty was met with in attempting to prevail on him to touch a prescribed spot quickly with the tip of the finger; but after he properly understood what was wanted of him, he was found to do so very satisfactorily with the left hand, but very slowly, painfully, and imperfectly with the right.

With eyes closed he still managed to touch the tip of his nose with the left forefinger very quickly and accurately, but the attempt to do so with the right met with little success. The reflexes are examined, and there is found to be absence of the tendon reflexes in the right arm. Those in the left arm seem to be satisfactory. The superficial abdominal reflexes cannot be elicited on either side, nor can any trace of cremasteric reflex be brought out on either. The patellar tendon reflex on both sides is strongly demonstrated; but it requires some trouble to elicit it, primarily because of his

difficulty in understanding that he is desired to keep his limbs quite lax, and not to hold them stiff. The right jerk is, however, thought to be very clearly more forcible and full than the left.

On one occasion of examining the patient a marked tendency to ankle clonus was brought out, but on a later examination no sign of it could be got.

There is distinetly impaired plantar excitability, although the degree of rigidity of the right knee and ankle-joints tends probably to interfere with the proper development of the reflex.

As regards the aphasic phenomena, the following points are to be recorded :—

On the whole, it would seem that the patient is capable of following with a very fair degree of understanding conversation about familiar objects and subjects carried on in his hearing, and he will occasionally chime in with a gesture of assent or an appreciative "yes" or "no," evidently being cognisant of the conversation. While, for example, his wife was giving her story, he listened with interest and interspersed it with a number of monosyllabic exclamations. Then, too, he was able, not without repeated direction however, to understand what he was to do when his sense of touch was being investigated, namely, to call out whenever touched, and to indicate the part touched.

His vocabulary, as a rule, is very limited, little beyond "yes" or "no" being obtained; but not infrequently, when driven into a corner, the negative exclamation would be supplemented by "can't say," "can't tell," "don't know," and once or twice when in trouble thus he would, with a disappointed gesture, point to the right cheek and forehead, with the remarks "all there," "bad," &c. An attempt is made to get him to repeat a sentence dictated; but it is found impossible to get him to repeat even his own name. Also, if a number of the simplest monosyllabic words are put before him, he cannot be induced to name any of them; and even on his being again and again informed of his name, he is found unable to repeat it properly. Over and over again he is told to

say "the," and persistently he says "me," "me," evidently only the vowel sounds being appreciated. He is even given letters and asked to form them into simple words, but with no result except "no, no," "can't, indeed." He is asked to pick out certain letters of the alphabet, but is found quite unable to do so, although if any one is taken up, and he is asked questions as follows, he hits on the right one almost invariably —thus, "Is it B?" "Is it M?" "Is it S?" and so on, giving the true one at random, when he at once makes an affirmative reply. He evidently has an appreciation of similarity in the outlines of letters and the reverse, for if two or more of one letter are present before him he recognises this very readily, and hands them up with an appreciative gesture. At times great trouble is met with in getting him to follow directions although often repeated, but immediately on a descriptive sign or gesture being made he understands at once.

Familiar objects are given him, but he is unable to name them although evidently recognising them—thus, a bunch of keys he cannot name, but he can express by movements the use of an individual key. A watch is given him and he cannot give its name; but, on constant pressing, he suddenly blurts out, "Can't remember—had one myself." Spectacles he indicates the use of, and so on for other objects. He cannot tell his own name, but if a number of names are handed to him in written or printed characters he picks out his own at once. If asked in what town he lives he cannot tell, but if the word Glasgow be mentioned after the names of a number of other towns have been repeated he at once expresses vigorous assent. Similarly, if Glasgow be written or printed in the midst of the names of many other towns, he never fails to point it out when asked in which of these towns he dwells. Every effort, however, to get him to repeat the word "Glasgow" after the physician is unavailing, all that he can do being to say "no, no," "can't, indeed," or to vigorously shake his head.

He cannot, of course, write; but when letters are printed before him, and he is requested to copy them out with his left hand, immediately on being shown the way he makes an

attempt to carry out the effort, and, although somewhat painfully and imperfectly, he manages to reproduce one or two simple letters such as O, C, N, &c.

Vision and hearing seem to be quite unimpaired.

Some days after admission he made a quite legible attempt at writing his name from a copy set before him.

On the 7th November, 1895, William C.'s case was brought before the clinical class, and the phenomena which have been described in the foregoing paragraphs were fully demonstrated. On the 11th he was put upon a course of treatment in all respects similar to that carried out in Cases I and II, but without any beneficial effect, and he was dismissed upon the 26th January, 1896, *in statu quo*.

I formed the opinion that there was in William C.'s case a syphilitic lesion in the region of Broca's lobe, which, however, had caused more or less complete destruction of many of the essential nerve elements in the affected area. The history of his having suffered from venereal disease in India, the persistent discharge from the greatly deformed nose, the long continued headache accompanied by melancholic depression and culminating in a sudden aphasia, were the chief circumstances which led me to arrive at this diagnosis. Owing to the manifest destruction of cerebral tissue which had resulted, it was unlikely that any great improvement either of the aphasia or the paralysis could be hoped for, more especially if, as I think, this destruction had taken place at the very onset of the paralytic symptoms, owing to the extent and severity of the determining lesion.

I shall now conclude this lecture by giving you a short account of a case which came under my care eight years ago in the Dispensary of the Infirmary, and in which very severe syphilitic headache, associated with the most alarming epileptiform convulsions, was promptly relieved and kept in check by a prolonged course of antisyphilitic treatment. Probably the best way to do this will be to transcribe the notes which I made at the time in my case-book.

CASE IV.—*Severe and protracted headache associated with alarming convulsions and mental derangement, of undoubted syphilitic origin; long continued ulceration of scalp; headache and fits relieved and kept in check by prolonged mercurial treatment.*

Robert M., æt. 37, railway stoker, formerly soldier in India, where he had repeated ague, married, with one healthy child aged 3 years, was admitted to the Royal Infirmary Dispensary on 1st August, 1888, complaining of severe pain in the head of three or four months' duration, beginning in the forehead and extending to the occiput. The headache is very severe, being much worse at night, entirely preventing sleep. He has had three epileptic seizures since this illness commenced —the first about three months, the last about one month ago. The first of these seizures came on quite suddenly one evening after the patient had returned from work. He says that he becomes "quite absent-minded at times," and his whole expression at the time of admission is dull and lethargic, so that great difficulty is experienced in interrogating him. He also complains of his memory having become very defective since the illness began. Otherwise he is a well-nourished man with a good appetite.

He had gonorrhœa in 1879 while in India, and two or three years before this he contracted a hard chancre, followed by well-marked secondaries, which confined him to the military hospital for forty days. He has been married for five years, and his wife has had no miscarriages.

Percussion of the scalp revealed great tenderness over the right side of the frontal bone. No paralytic phenomena could be made out. A distinct depressed scar was detected on the glans penis. A diagnosis of syphilitic headache was made, and he was put upon the following mixture:—

℞.—Hydrarg. perchlor.,	. . . .	1 gr.
Potas. iodidi,	. . . . .	3 drs.
Spt. chloroformi,	. . . .	½ oz.
Inf. gentianæ co.,	. . . ad.	8 oz.—M.

SIG.—Half an ounce three times a day.

6th August, 1888.—Great improvement since treatment commenced, which is also evident to his wife, who says that the "vacant look on his face" is gone, and the pain in his head much relieved. The perchloride of mercury in the mixture is increased to $1\frac{1}{2}$ gr.

15th August.—Headache now quite gone; still sleepless at night, and somewhat absent-minded. In a few minutes he returns to the consulting room to say that he felt as if another fit were coming on; 30 grs. of bromide of potassium were administered, and the feeling soon passed off.

20th August.—Feels quite well, and anxious to return to work. No further threatening of fits. Mercury in mixture increased to 2 grs.

31st August.—Has been at work as a stoker on the railway, and feels quite well. Medicine continued.

5th September.—Still well and working. Mercurial mixture replaced by quinine and iron tonic.

14th September.—Discharged to-day feeling quite well in every way.

24th September.—To-day patient presented himself again. His wife informed us that her husband had continued well and at his work until Saturday, the 22nd September. About 2 A.M. on the 23rd he suddenly took a convulsion fit; between 11 P.M. on Sunday night and 2 A.M. this morning he had ten fits in all, never properly conscious between them, and each seizure said to have lasted about five minutes. She could give no precise information as to the distribution of the convulsive movements, but it seems to me that there is very slight paralysis of the left side of the face. His old mercurial mixture was again resumed.

28th September.—On the evening of Monday (the 24th) he had eight fits, and on the morning of 25th eight more. His wife now informs us that the fits begin by twisting of the head to the left side and raising of the left arm, but that the movements soon become general. Since the last epileptic seizure he has been improving gradually, and he is ordered, in addition to his internal medicine, to rub 1 dr. of blue ointment into a soft part of the skin daily.

5th October.—Improvement continues. On percussing the skull to-day a broad linear depressed cicatrix, transverse in direction and about 2 inches long, is discovered on the scalp a little behind the vertex. His wife states that this is the scar of a sore which had been completely healed for about nine months, after having been open for about a year.

It is unnecessary to continue these extracts from my Dispensary case-book, as from this time till the date of my last note on 9th April, 1889, he remained perfectly well. Until the middle of October, 1888, he continued the daily use of mercury, both by the mouth and by inunction; but, thereafter, as the gums had become slightly touched, he alternated the one method of administration with the other, using each for two or three weeks at a time, until the middle of February, 1889. When I last saw him in April, 1889, he was perfectly well, and had been daily at his work on the railway since the beginning of the previous November.

That the affection just described was of syphilitic origin there can be no doubt. The clear venereal history, the long continued ulceration of the scalp, the nocturnal character of headache, and the very remarkable control of all the symptoms effected by the use of mercury and iodide of potassium, demonstrate conclusively the syphilitic origin of the disease. A study of the foregoing extracts from my case-book also clearly proves that it is a mistake to discontinue antisyphilitic treatment too soon. Had I not done so in the present case I might have saved my patient a very serious and alarming illness. I lost sight of him after the date of my last note; but on the whole I have the feeling that I would have liked to have had him under observation and occasional treatment for six months longer. I mention this to impress upon you by my own mistake the necessity of continuing the specific treatment for some time after all symptoms have disappeared. I do not say how long; some say six months, some a year, some two years; but there can be no rule, and the length of time must be left to the discriminating judgment of the physician, who will remember that he must treat the man as well as the malady. Only do not err on the side of too

little treatment. Do not be afraid of touching the gums slightly, but there is nothing to be gained by pushing the mercury beyond this, and its administration should be stopped till the incipient salivation ceases.

The cases recorded in this lecture form on the whole a somewhat interesting and instructive group. You will have observed, both from the symptoms described and from my introductory remarks, that we have been dealing specially with syphilis in so far as it is concerned with the sudden production of nervous derangement, "shocks," "fits," "convulsions," "paralysis," &c. Now it must be admitted that in one sense the cases we have been studying were not sudden in their onset, and yet, in spite of this admission, I am in no way inclined to change the title of this lecture. The diseases were sudden in that the alarming, striking, obvious manifestations of their presence were rapid in their development. A headache, of course, cannot be felt by any but the sufferer, and consequently, except in cases of exceptional or agonising severity, it is possible that it may be lightly regarded by the patient's friends. A general feeling of malaise or inability for customary exertion may be naturally enough expected to pass off in a day or two with rest and fresh air. But a convulsion, an inability to speak, a loss of memory, or a palsy, is a fact too palpable, especially if rapid in its development, to be neglected by any; and as regards phenomena of this kind our cases may be said to have been sudden in their onset.

At the same time it has further to be admitted that to the skilled observer there is another sense in which the diseases we have been studying can hardly be regarded as sudden in nature. To the physician, a sudden hæmorrhagic apoplexy is often but the culminating event of a long series of morbid phenomena which, to the patient and his friends, may seem of the most trifling moment. In like manner, a sudden nervous shock due to the syphilitic virus may be preceded by a number of symptoms of the greatest significance to the practitioner. Of these prodromata one of the most important

is headache. Perhaps the chief diagnostic feature of syphilitic headache is its nocturnal character. It is not infrequently confined to a limited area of the head, very often having the characters of hemicrania. It is to be remembered also that in syphilis headache is met with both in the secondary and the tertiary stages of the disease. In the former the headache coincides with the presence of other secondary phenomena, the rash, the alopecia, and the nocturnal rheumatism, and it disappears with these either spontaneously or under the influence of treatment. It is the headache of the tertiary stage, however, that is of importance as a premonitory symptom in the class of cases we have been studying, and no effort on our part should be awanting, by careful investigation of the history and by the discovery of corroborating manifestations, to enable us to recognise at the earliest date the true nature of such a headache. Among other prodromata may also be mentioned intellectual dulness and stupor, and the occurrence of gummata on the bones of the legs or on the scalp. By the early recognition of such antecedent phenomena we are often enabled by appropriate treatment to prevent those sudden developments so full of terror to the patient and his friends, and so fraught with danger to the delicate elements of the nervous tissue involved; and I am not without hope that our study of the cases now recorded may serve as an additional confirmation of the truth of the old adage that "prevention is better than cure."

LECTURE V.

ON THE JAUNDICE OF EARLY INFANCY, WITH A CASE OF CONGENITAL OBLITERATION OF THE BILE-DUCTS.[1]

On the 19th of February, 1896, a male child, aged 4 months, along with its mother, was admitted to Ward 8, and during the two or three days that it lived after admission we had some opportunities of examining it together. The case was one of fatal infantile jaundice, and may serve as a text for a clinical lecture upon the varieties of jaundice occurring in early infancy. Before relating the case in detail, and demonstrating to you the abnormal condition of the liver, I shall make some remarks upon the general subject of jaundice occurring during the first days of life, or *icterus neonatorum*.

Icterus neonatorum may be of two varieties—it may be *mild* or *grave*.

1. *The mild variety* usually sets in on the second or third day after birth. The yellow discolouration is not equally marked all over, and is generally most pronounced upon the forehead, round about the mouth, and on the trunk. The urine in such cases may not stain the linen, and frequently the motions are not specially pale, but as a rule the conjunctivæ are distinctly jaundiced. The prognosis is almost always good, and in the course of eight or fourteen days at most the yellow colour fades, and the skin resumes its normal appearance. It is unnecessary for our present purpose to discuss in detail the various theories which have been advanced as to the pathology of this mild form of jaundice.

[1] Delivered 10th March, 1896.

You will find an admirable summary of them in the first volume of Henoch's treatise on the *Diseases of Children*, translated by Dr. John Thomson for the New Sydenham Society. Some authorities regard the jaundice as *hæmatogenous* in origin, the yellow colouring matter being due to a great destruction of red blood corpuscles taking place immediately after birth, as the result of a great number of red discs being forced into the infant's vessels from the placenta. Others explain the yellow discolouration of the skin and internal organs by supposing it to be due to an actual absorption of fully formed bile, *hepatogenous jaundice*. As to the discolouration being bilious there seems to be no doubt, although as to the actual mode in which it is brought about we still require more light.

The affection is very common, and is well known among the poorer classes, by whom it is frequently spoken of as the "yellow-gum." The following figures from Baginsky's handbook (1889) will give you some idea of its great frequency:—Porak found it 198 times in 248 children, or 79·8 per cent; Kehrer, 474 times in 690 children, or 68·7 per cent; Elsässer, 215 times in 434 children, or 49·5 per cent; Seux, 64 times in 406 children, or 15·6 per cent; Cruse, 261 times in 308 children, or 84·46 per cent. These figures are sufficient to show that even at the lowest estimate it is a very frequent disorder. If we take the sum of the figures just quoted, we find that the disease occurred 1,212 times in 2,086 children, or 58·1 per cent. It is said that on the whole boys are more frequently attacked than girls.

As regards the treatment of this affection little need be said. Henoch and Baginsky are both agreed that the prognosis of uncomplicated cases is always favourable. Henoch says—"One need scarcely speak of treatment since the affection disappears spontaneously. All that is required is good nursing, with attention to the bowels when necessary."

2. *The grave variety* of icterus neonatorum is associated with serious organic lesions, and is almost always a fatal disorder. It is sometimes a septicæmic condition, due to an

erysipelatous inflammation attacking the navel, not infrequently the result of "puerperal infection of the umbilical wound."

Occasionally this form of infantile jaundice is caused by syphilitic hepatitis, and Henoch has reported a case in which he was of opinion that the affection of the liver had originated during intra-uterine life. The child died deeply jaundiced at the age of 10 weeks, and in the liver the "bile-ducts were found *post-mortem* to have been entirely transformed into thick fibrous masses filling the portal fissures."

In a number of cases the icterus is due to congenital absence or obliteration of the bile-ducts. Fortunately this affection, of necessity in the long run fatal, is comparatively rare, and Henoch, with his large experience, had in 1889 only met with three cases, two coming to a *post-mortem* examination. One of the best monographs in our language on congenital obliteration of the bile-ducts is that of Dr. John Thomson, of Edinburgh, published in 1892, to which I would refer you for exceptionally full and accurate details of the affection. In his monograph Dr. Thomson has collected and carefully tabulated forty-nine cases which were confirmed by *post-mortem* examination, and before proceeding to describe in detail our own case I may state to you a few of his conclusions, which are of clinical importance. With regard to the health of the parents his statistics do not establish anything of great etiological significance. In only five out of the ninety-six parents was evidence of syphilis obtained; and in several cases one or both parents had suffered severely from some digestive derangement. There also occasionally seems to be a "tendency for the disease to occur in more than one child of the same parents." In this regard a case reported by my friend, Dr. John Glaister, is worthy of note—"Out of seven children in the same family four had died jaundiced, and two were less severely jaundiced and recovered." The jaundice may set in from the day of birth up to nine or ten days after it; in a very few cases it may not appear for a fortnight or more. Bile is generally to be made out in the urine, and, after all the meconium has been passed, the motions are usually white. If they are white from the first, it indicates that

the obliteration of the biliary passages has taken place at a very early period of intra-uterine life. Spontaneous hæmorrhage is one of the commonest complications, having occurred in fully half of the recorded cases. Life may be prolonged from one week to four months; in two of the cases the children lived into the eighth month. Those of you who desire to study the pathology of this interesting disease may do so in the pages of the monograph itself; it is unnecessary for me to enter upon it here, further than to say that Dr. Thomson does not think that syphilis has very much to do with the causation of the diseased condition of the biliary passages.

We are now in a position to consider in detail the clinical features and *post-mortem* appearances of our own case.[1] The child had been seen in the Dispensary by Dr. Walter K. Hunter, who, recognising the gravity of the condition, advised the mother to seek admission to the ward. The mother stated that she first noticed the discolouration about a week after the child's birth, when she had risen for the first time after her confinement. Her attention was first drawn to the dark colour of the child's eyes and cheeks; but it was not until about three weeks after this that the idea of the child being the subject of jaundice was suggested by a neighbour. She then consulted a medical man, who prescribed powders without any good effect.

The baby was the first, and was born at full time without any trouble. During the last two months of pregnancy the mother was very much troubled with "bile," vomiting very frequently, and taking a violent dislike to many kinds of food. Previously she had always been healthy, except for occasional bilious attacks. The father was perfectly healthy. The parents of the child were newly married, and were each about 22 or 23 years of age. The paternal grandfather, who, as well as the father, was seen by myself, was a healthy-looking

[1] An account of this case has already been published in the *Archives of Pediatrics*, October, 1896, and is here reprinted with a few verbal alterations.

man of middle age. The maternal grandfather died of phthisis pulmonalis, the grandmother of general debility.

The baby had all along been fed at the breast; and from the first the bowels moved quite regularly, but the motions were persistently pale, and, as described by the mother, "like curdled milk." During the first month after birth the child was very fretful, but was otherwise well. On special inquiry as to whether the yellow discolouration of the skin was present at the time of birth, the mother was unable to say, but she thinks it must have been. There was no trouble with the cord or the umbilicus after birth. During the week or two preceding admission the child was frequently seized with vomiting after taking the breast, but this was likely to have been the result of over-distension, as it generally occurred when he was fed after waking from a long sleep.

On admission the child was intensely yellow, the discolouration being perhaps most strikingly seen in the conjunctivæ. Otherwise the baby looked very healthy and well nourished. Although, on the whole, he was very fretful and cried constantly, at times he was cheerful, jumping and crowing, and smiling in his mother's lap, even after his admission to the ward.

A careful physical examination of the heart, lungs, and liver gave no sign of any abnormality. The urine had a clear greenish-yellow colour; there was little or no sediment, the reaction was acid, and it contained no albumen. There was not enough to take the specific gravity, and the urine could only be examined on one occasion.

On the evening of the 21st of February vomiting took place, and the vomited matter was tinged a pink colour as if it contained blood.

On the morning of the 22nd of February the motions of the bowels were for the first time observed to be black and tarry. There was moderate diarrhœa all day, and the evacuations were uniformly black in colour, and sometimes mixed with bright red blood. Throughout the day the child was very fretful, and on account of its evidently debilitated condition, it was found necessary to administer brandy some-

what freely. About 8·30 P.M. on the same day he became somewhat suddenly blanched, and it was impossible to feel the pulse. The respiration soon became embarrassed, and death took place about 10 o'clock. After death, some bright red blood escaped from the mouth and the rectum.

With very great difficulty indeed I obtained permission for a partial *post-mortem* examination of the abdomen, which was performed by Dr. Charles Workman, whose report I shall now read:—

"*Summary of post-mortem.*—Absence or obliteration of hepatic and cystic ducts. Cirrhosis of the liver. Hæmorrhage into stomach and intestines.

"*External appearances.*—The body is that of a fairly well developed child for the age of 4 months, and it is also very well nourished. The skin and conjunctivæ are stained of a deep yellow colour. On opening the abdomen (permission having been obtained for this only, and that with great difficulty), the stomach and intestines were found to contain a considerable quantity of blood, which had evidently escaped from the greatly congested capillaries without any gross rupture. The spleen was of large size, firm in consistence, and deeply congested. The pancreas presented a remarkably healthy appearance, and it was possible to press some whitish fluid from its duct into the duodenum through the papilla. The gall-bladder contained only clear colourless fluid with white shreds; it was of small size and somewhat shrunken in appearance. The cystic duct, the hepatic ducts, and the common bile-duct had either never become patent, or had been transformed into white fibrous cords, and it was evident that no bile had ever made its way into the gall-bladder or into the duodenum. The liver was of fairly large size, and presented a dark green colour, with a remarkable marbled appearance of the cut surface. The free surface of the organ was the seat of distinct but very fine granularity, quite evidently of cirrhotic origin. The kidneys were very markedly lobulated, and their capsules were removed without difficulty. On section they were found to be deeply congested, but the cortex and pyramids presented quite normal relationships.

"*Microscopical examination* of sections of the liver, stained in alum carmine solution, revealed a very marked cirrhosis, with in many parts the portal areas choked with leucocytes. The cirrhosis involved groups of lobules, and was therefore of the multilobular variety. The rows of liver cells in many of the lobules were separated as by dilated capillaries; the microscopic bile-ducts were numerous, of large size, and frequently filled with inspissated bile. In many parts of the hepatic tissue granules of bile pigment were observed."

We had, on the whole, during the life of the child, little difficulty in arriving at the opinion that the jaundice in this case was likely to be due to some organic obstruction or defect of the biliary passages.

It is perfectly obvious that with a serious structural defect of the kind demonstrated at the *post-mortem*, and which I now show you in the dissected specimen, treatment could have been of no avail; and the lesson the case teaches us is that whenever an icterus neonatorum persists longer than a week or two we should be prepared for the presence of a serious organic lesion and an ultimately fatal issue. If you compare the history of the case with the quotations I have made from Dr. Thomson's monograph, you will see that almost in every respect it conforms to the description which he has so well given. As to the actual cause of death in this case, I think there can be no doubt that it was due to the sudden and somewhat severe hæmorrhage from the stomach and bowels.

LECTURE VI.

CASE OF SPASTIC HEMIPLEGIA OF GRADUAL ONSET, FOLLOWING A SEVERE ATTACK OF ENTERIC FEVER, AND TERMINATING IN INSANITY.

As probably constituting a rather unusual sequela of enteric fever, I think the case which I now bring before you is of some interest. Goodall and Washbourn[1] tell us that various mental affections may follow enteric fever, and Hilton Fagge[2] states that Nothnagel and others have recorded paraplegia as an occasional sequela, although it is uncertain whether the lesion was in the cord or the peripheral nerves.

In view, then, of the peculiarly spastic character of the hemiplegia in this patient, and of its definite association with a severe attack of enteric fever, as well as of its ultimate termination in insanity, I think the case worthy of record.

J. J., æt. 22, miner and soldier, admitted 11th April, 1896, to Ward 7, complaining of stiffness of left hand and pain over top of left foot since July, 1895.[3]

Patient enjoyed very good health all his life until last May, when he had, while out in India, an attack of enteric fever which confined him to bed for two months. About three weeks after recovering from this he began to experience difficulty in approximating the fingers of the left hand to one another. This difficulty increased, and was gradually

[1] *Manual of Infectious Diseases*, H. K. Lewis, London, 1896, p. 309.

[2] *Practice of Medicine*, J. & A. Churchill, London, 1891, vol. i, p. 149.

[3] Clinical report by Mr. Archd. Young, B.Sc., M.B., C.M.

augmented by a feeling of stiffness and difficulty in extending the fingers of this hand. Soon he found the fingers getting more or less immovably fixed in a position of flexion upon the hand, although the phalangeal joints remained in an extended state. Coincidently with this trouble he began to experience pain over the top of the left foot when walking, and this he feels still in the same circumstances. During the last week of the fever his right leg was very much swollen, but it got well again during his voyage home from India at the end of the year.

He joined the army in 1892. Previously he was a miner.

Fig. 23.

Showing usual state of hand. (*Photo. by Archd. Young, B.Sc., M.B.*)

Since coming home he has been discharged from the army on account of the condition of the hand.

He has never had venereal disease, he says. He smokes about 3 ozs. of tobacco per week. He takes his food well, and his bowels are, on the whole, regular. He has never had any breathlessness or cardiac palpitation. He complains of no tremor or tingling of arms or legs. He states that although he never had ague while in India, he has had several attacks since coming home.

He has two brothers and two sisters alive and well. One brother was suffocated at the age of 14. His mother is dead; cause unknown. His father is still alive.

FIG. 24.

Showing condition of arm and leg. (*Photo. by Archd. Young, B.Sc., M.B.*)

Patient's only complaint of any consequence is as to the left hand and wrist. The condition of these is as follows:—

The fingers are flexed upon the palm of the hand more or less. They can passively and slightly, by voluntary effort, be extended within narrow limits. The thumb is turned outwards, and flexed at the inter-phalangeal joint (see Fig. 23). Forcible extension of the fingers is accompanied by considerable pain, but the thumb is less painful in this respect. The wrist-joint is fixed, evidently largely by muscular spasm, and not by definite ankylosis. Movement of flexing the fore-arm on the arm is perfectly easily accomplished, but it is accompanied by considerable fine tremor of the whole arm. On attempting to raise the left arm above the head it becomes evident that there is little movement at the shoulder-joint. Most of the movement is accomplished by moving the arm and shoulder *en masse*, and, as a result, the range is much more limited than on the other side. There is no definite wasting of any of the arm muscles. The position of the thumb in relation to the other fingers is further noted. It is turned round in such a way that it rests upon the radial aspect of the first phalanx of the forefinger. As regards the foot, there is noted a spastic condition evidently involving the extensors, so that the toes are all drawn well up upon the dorsum of the foot, the first phalanx in each case being drawn far back upon the metatarsal bone. The extensor tendons stand out like cords. Despite this, movement of the ankle-joint is fairly free, although rather jerky. The power of the muscles of the thigh, as tested by making and resisting movements of flexion and extension at the knee, is fairly good in both lower extremities, and no appreciable difference is made out between the two sides.

Sensation is tested in both upper and lower extremities, and found to be normal. The reflexes (tendon) in the left upper extremity are abolished; in the right, normal. The superficial abdominal and cremasteric reflexes on the right side are easily elicited; the former can be faintly brought out on the left side, but the latter on the left side cannot be elicited. The knee reflex is distinctly exaggerated on the left side, and

ankle clonus is very marked, while on the right side the knee reflex is normal, and there is no ankle clonus.

There is no facial paralysis, but there is a fine tremor of the eyelids of each side when they are closed.

The radial pulses are alike in strength of beat, and the limbs are alike in temperature, as far as can be made out by the hand.

The heart and lungs are investigated and seem quite normal.

There is over the body a sudaminous rash. He sweats a good deal, but has not noticed that one side of the body is more affected than the other.

The right calf, 5 inches below patella, measures 14 inches; the left, $12\frac{3}{4}$ inches.

Urine.—Specific gravity, 1022; acid, high coloured. Slight haze in heat test for albumen. No sugar.

At my request, Dr. T. K. Monro investigated the case, and made the following notes upon the 12th April, 1896:—

Girth of wrist just above styloid process (narrowest part of fore-arm), $6\frac{5}{8}$ inches on both sides; 3 inches below external condyle of humerus, on right side $9\frac{7}{8}$ inches, on left $9\frac{1}{2}$ inches; at deltoid insertion, on right side, $9\frac{7}{8}$ inches; on left, $9\frac{1}{4}$ inches; at mid-upper arm, right side, $10\frac{1}{4}$ inches; on left, $10\frac{1}{2}$ inches.

It appears to Dr. Monro, after careful examination, that a distinct, though very slight, difference can be detected between the two sides of the face. Even at rest the left naso-labial groove is scarcely so deep as the right, and the difference is quite as evident when patient is told to show his teeth. The ocular movements appear to be perfectly carried out.

It will be seen from the figures given above, that the left upper limb is, on the whole, slightly thinner than the right, but it must be remembered that patient is naturally right-handed. The greater relative thickness of the upper arm on the affected side appears to Dr. Monro to be possibly connected with a certain degree of permanent spasm of the left biceps.

It is found to-day that there is a certain tendency to ankle clonus on both sides, in so far as a single blow on the *tendo Achillis* will call forth several contractions of the calf muscles when the leg is in the appropriate position on either side.

With a little trouble a fully established ankle clonus is obtained on the left side, though not on the right. Knee-jerk is well marked on both sides, and is particularly brisk on the right side. The cremasteric reflex is present on both sides alike, and the abdominal reflex is also obtainable on both sides. On first trial it is particularly brisk on the left side, but afterwards scarcely more so than on the right side.

Patient appears not to have been troubled at any time with actual pain in the affected limbs.

Dr. Monro thinks the evidence conclusive that the lesion in this case is one impairing the integrity of the upper segment of the motor path within the cranium.

The fundi, on examination, seem normal.

14th April, 1896.—At 2 P.M. to-day patient had a rigor. No observations of his condition were noted (as he made no complaint) until 4 P.M. At that time profuse perspiration had broken out all over his body uniformly, and his temperature was 104°. On interrogating him it is found that he had a slight attack of ague on 11th April, which also passed over without complaint being made, and was therefore not noted.

16th April.—Patient had another attack of ague, beginning again at 2 P.M. to-day and lasting about six hours. The maximum temperature was 103°.

Treatment.—12th April.—Patient to passively move the affected fingers for ten or fifteen minutes morning and evening, so as to gradually increase the maximum range of movement; the suppleness of the fingers to be increased by bathing and shampooing; the affected fingers to be regularly exercised as soon as possible by some mechanism resembling a key-board.

℞.—Liq. strych. hydrochlor.,	. . . .	1 dr.
Spt. chloroformi,	. . . . .	2 drs.
Inf. quassiæ,	. . . . . ad	6 oz.

Sig.—Half an ounce three times a day twenty minutes before food.

15th April.—

℞.—Calomel., ... 2 grs.

Sig.—To take during afternoon.

1st May.—Stop liq. strychninæ.

℞.—Pot. iod., } . . . . . āā. 2 drs.
Pot. brom., }
Tk. nuc. vom., ... 1 dr.
Syr. aur., ... 1 oz.
Aq., ... ad 8 oz.

Sig.—Half an ounce three times a day.

2nd May.—Galvanic current, 5 to 10 milliampères, thrice weekly, positive pole at nape, and negative down spine and left arm.

It is very difficult, in my opinion, to form any very precise diagnosis as to the actual site or nature of the cerebral lesion in this case. On the whole, I think there can be no doubt that the lesion is definitely related to the attack of enteric fever. It is perhaps more likely to be cortical than ganglionic, notwithstanding the absence of fits; and, having regard to what seems to have been a thrombosis in the vessels of the right thigh giving rise to swelling of the limb, it has most probably been of the nature of a surface thrombosis of the right motor convolutions.

Since the patient was shown to the clinical class, the following additional notes have been made:—

6th June.—During his residence patient had one or two malarial attacks after those noted above. Since 2nd May, when galvanic stimulation was begun, his hand has been less spastic than before; the fingers can now be passively extended with the use of less force. The improvement, however, has been slight. Dismissed to the Home to-day.

26th June.—This man reported himself to-day on his return

from the Home. No improvement falls to be noted in the condition of his hand. His general health, however, is much better.

August.—Nurse informs us that he is now an inmate of Stirling District Asylum, Larbert.

Recently I asked my House Physician, Dr. J. D. Graham, to write to the authorities of the Asylum for information, and in reply to his inquiries he received from Dr. Alfred Cowper the following letter, which is an accurate and full account of the course of the case after passing out of our hands. I now, with Dr. Cowper's permission, publish it in full:—

"Stirling District Asylum,
"Larbert, *8th February, 1897.*

"Dear Sir,—As Dr. Macpherson is unable at present, owing to illness, to answer your letter, I take the liberty of giving you some particulars about J. J. He was admitted to this Asylum in July last labouring under an attack of acute mania, with delusions of grandeur. I presume you will wish me particularly to refer to the condition of his arm and leg (left), as that would probably be the affection for which he was under treatment with you, and it is the point about his case which has most interested us. Perhaps I needn't describe particularly the condition of his limbs on admission, as possibly the symptoms were much the same when he was under your care, further than to say that the left arm had assumed a flexed position, while the left leg was kept stiff, and moved in a spastic manner when he walked. If, however, you should wish a detailed account of the affection I should be glad to tell you all I know. There was little or no atrophy apparent to the unaided eye in any of the muscles. At first we regarded the affection as spinal in its nature, and put it down as due to post-febrile paralysis. The usual methods of treatment were adopted, but without effect. During the application of faradism we noticed the response of the muscles to faradic irritability.

"In course of time we began to think that after all it might possibly be a case of a hysterical or functional nature, and we attempted to hypnotise the patient; but owing to his mental condition great difficulty was experienced in getting him under its influence, and the attempt was abandoned. His mental symptoms disappeared early in December, and we resolved to put him under chloroform. This was done, and it was found that when deeply under the anæsthetic his arm could be extended with great ease and moved about in every direction, with the exception of the metacarpo-phalangeal joints of the four fingers, which were stiff and quite immovable.

"The points that guided us in inclining to a diagnosis of the hysterical nature of the case were as follows:—

"1. The varying intensity of the symptoms. The flexion of the arm was not constant; at times it admitted of limited movement and a limited power of passive extension. But at other times the spasm in the flexors was intense, and manipulation was almost consciously resisted. The symptoms in the leg varied even more than in the arm.

"2. The comparative absence of atrophy of muscles considering the duration of his illness—since the middle of 1895. Measurements taken last month showed that while there was a degree of atrophy the greatest difference was between the right and left thighs, which was only $1\frac{1}{4}$ in.

"3. The apparently normal response of the muscles to faradic irritability.

4. The complete disappearance of the symptoms under deep chloroform narcosis.

"There were also the peculiar hysterical posture of the patient, and the difference between the symptoms in the two limbs.

"These are the main features of the case, as far as we have got as yet.

"I was anxious to know in which ward of the Royal Infirmary the patient had been treated, as I should be very glad to get any information about his condition and treatment while there. It is possible we may publish the case, and

we should be glad to hear from you if you have at hand any facts which may help to clear up the case.—Yours very truly,

"ALFRED COWPER,
"*Assist. Med. Officer.*

"DR. J. D. GRAHAM,
"Glasgow Royal Infirmary.

"I ought to have said that on coming out of the anæsthesia the first effort on returning consciousness was expended in the reproduction of firm flexion in the arm."

LECTURE VII.

ON A CASE OF MALIGNANT TUMOUR ORIGINATING IN CONNECTION WITH THE ROOT OF THE RIGHT LUNG AND ASSOCIATED WITH MULTIPLE MALIGNANT TUMOURS, SOME OF WHICH WERE SITUATED IN THE INTEGUMENT.[1]

THE case to which I propose shortly to direct your attention this morning is of twofold interest and importance—(1) On account of the ease with which, after admission to hospital, a diagnosis of intra-thoracic malignant disease was made; and (2) because of the difficulty in deciding from the histological characters alone whether the growth is to be regarded as of cancerous or of sarcomatous nature. As regards the first of these points the case now to be related may be advantageously contrasted with that of Mrs. B., upon which I lectured on the 11th January, 1896 (see p. 19), and in which the malignant mediastinal mass was only discovered after the death of the patient. With reference to the second point I would like to insist upon the similarity of the present case to one of primary cancer of the mediastinum originating in the tissue of the right bronchus which I have recorded in my book on *Mediastinal Tumours*.[2] In their clinical development the resemblance of these two cases is remarkably close and striking, both as regards the lesion at the root of the lung and the development of superficial and tegumentary tumours.

Bearing my former case in mind, notwithstanding the difficulties raised by the histological examinations which are

[1] Delivered 31st October, 1896.

[2] H. K. Lewis, London, 1892, p. 52.

referred to in the report of Dr. Workman, I am much inclined to regard the present case as of cancerous nature.

Matthew J., a draper, æt. 45, was admitted to Ward 7 on 18th September, 1896, on the recommendation of Dr. Burges, of Crown Street, on account of a swelling, of two months' duration, on the left side of the front of the neck, accompanied by severe dyspnœa and progressive emaciation.

The following notes of the clinical history have been supplied by Dr. Burges, who first saw the patient in his consulting rooms on 24th November, 1895:—At that time phthisis, chiefly confined to the left apex, was diagnosed, but the respiratory murmur at the right apex was also noted to be harsh, and the percussion note if anything hyper-resonant. At this time the back of the chest was not examined. By the middle of December he was worse, without much change, however, in physical signs, although his face had become pale and pinched, and he was suffering much from hectic sweatings. About the same time, also, the patient directed attention to a small tumour in the right supra-scapular region, which increased rapidly in size, and at one time was suggestive of abscess or cyst. From the 3rd January till the month of March he was regularly under Dr. Burges's care, on the whole becoming worse, until the end of February, when some improvement took place, and the tumour became smaller, and firmer in consistence. It was, however, very tender, so that he could not bear the pressure of his clothes upon it. Upon the 9th May, Dr. Burges removed the tumour, and upon microscopical examination regarded it as a round-celled sarcoma. After this his general health improved very much for a time.

Shortly after the new year, when the patient was first confined to his bed, Dr. Burges discovered a patch of dulness extending from the spine of the scapula to the base of the right lung, and reaching outwards as far as the angle of the scapula. Over the dull area the vocal resonance was absent, and the R.M. became progressively weaker, ultimately disappearing altogether in a week or two. No history of

antecedent pneumonia or pleurisy could be made out. The doctor suspected encysted pleural fluid, but careful exploration at several points of the dull area gave no result.

About the beginning of July the patient noticed a small tumour beneath the anterior edge of the left sterno-mastoid, about the level of the larynx. During the month of August the tumour enlarged, and he did not feel so well. On 3rd September, Dr. Burges was again called in, and found the patient apparently suffering from laryngeal spasm; but at the same time the doctor was clearly of opinion that the R.M. had returned somewhat at the right base behind.

After his admission to Ward 7 the patient's chief suffering was caused by severe dyspnœa, often of a distinctly spasmodic character, but without definite stridor. Cough, with profuse expectoration, which had been present more or less since his first illness in January, was very severe, keeping him awake at night. He had little or no pain or difficulty in swallowing, but said that he had to be very careful to masticate his food well. The family history was quite satisfactory, and the patient's habits had always been good. He was extremely cachectic, and his voice was at times rather hoarse. The respiratory difficulty was not definitely laryngeal, but soon amounted to definite orthopnœa, and in the night-time frequent spasmodic exacerbations occurred. Dr. John Macintyre examined the patient on 1st October, and was of opinion that the spasmodic dyspnœa was as much bronchial as laryngeal, and advised against the performance of tracheotomy except in extremity.

At the left side of the neck below the margin of the sterno-mastoid there was a hard tumour, somewhat ovoid in shape, measuring 2 inches in transverse and $2\frac{1}{2}$ inches in vertical diameter. The tumour had displaced the thyroid cartilage and the upper rings of the trachea slightly to the right. It was of firm consistence, and on the whole painless. Shortly after admission, a small gland-like tumour was discovered in the left axilla, and a similar nodule—subcutaneous in position—was detected behind the left trochanter major. These masses were about the size of haricot beans.

On examination of the chest the heart was found to present healthy characters, and generalised bronchial wheezing was detected all over the lungs. The sputum was purulent, nummular, and abundant, but no tubercle bacilli could be found in it. Marked dulness was made out at the right base behind, the highest level being at the fifth spine, from which its upper margin sloped downwards and outwards so that at the lowest level the dulness extended outwards 5 inches from the middle line, the distance out at the highest level being $1\frac{3}{4}$ inch. Over this dull area the R.M. was very strikingly enfeebled, contrasting strongly with the exaggerated character of the breath-sounds over the whole of the left lung posteriorly. It was thought likely that the dulness was due to an intra-thoracic malignant mass pressing on the right bronchus and involving the base of the right lung. The patient died of exhaustion on the 4th of October, 1896.

Dr. James Finlayson, Mr. H. E. Clark, and Mr. J. H. Pringle saw the patient on different occasions during his residence, when the advisability of removing the cervical tumour was carefully considered. In view of the likelihood of there being a malignant mass within the chest, such a proceeding was unanimously considered inadvisable.

Dr. Workman, who made the *post-mortem* examination, has written the following report, which I now read to you:—

"There is a large hard tumour situated on left side of neck, which has caused some displacement of the larynx to the right. A subcutaneous nodule, the size of a hazel-nut, is found in the left axilla, and another over the left gluteus maximus. A similar nodule is situated to the right of the manubrium sterni. On raising the sternum enlarged glands are found in front of the great vessels behind the manubrium, and on removing the heart a hard mass is found occupying the perieardium. The pericardium is found to contain 4 oz. of blood-stained fluid. Both lungs are extremely adherent to the chest wall, so that the pleural cavities are almost obliterated. The right lung is almost replaced, below and behind, by a solid tumour mass, which involves almost the entire lower lobe. This tumour mass extends upwards, and

appears to have taken origin from the right bronchus in its lower divisions. The divisions for the upper and middle lobes are still patent.

"When the lung is laid open the branches of the bronchus in the lower lobe exhibit very marked bronchiectasis. The upper lobe is somewhat emphysematous, and in its substance there are a few tumour nodules.

"The trachea and larynx are healthy.

"The left lung shows, on cutting into it, extreme bronchiectasis of the upper lobe. There is also considerable bronchiectasis and emphysema of the lower lobe. The middle portion of the lung is fairly healthy. The dilated bronchi in both lungs are filled with yellow, very purulent mucus.

"There is no evidence of disease in the other organs."

On the 23rd October, 1896, I showed the specimens, which I now demonstrate to you, at the Glasgow Medico-Chirurgical Society, and you will see that they show well the interesting morbid changes described in Dr. Workman's report.

With reference to the nature of the tumour, Dr. Workman there stated that the preliminary examination of hastily cut sections from a portion of the tumour in the neck, together with the peculiarity of the distribution of the disease, and its history, made him believe at first that the case was one of cancer of the lung with secondary involvement of the back, neck, axilla, and hip. After more careful study of sections of the primary (?) tumour of the lung, of a small nodule also from the lung, and of the tumour in the neck had been made, he was forced to the conclusion that the tumour was not cancerous, but was of that kind which we are accustomed to call lympho-sarcoma or alveolar-sarcoma. The sections from the lung show masses of moderate-sized round or oval cells with little protoplasm and with oval or round nuclei; these masses not being divided up by connective tissue trabeculæ, as in cancer, but being aggregated into large groups separated only by blood-vessels and their accompanying connective tissue. In the hypertrophied pleura connected with the large tumour, there are masses of round-cell tissue, similar to the tumour tissue, accompanying the capillaries and small blood-

vessels, and sometimes surrounding them. Dr. Workman was inclined to regard the mass in the lung as the primary disease, because, from the history of the case, the lung symptoms were first noticed and were ascribed to phthisis pulmonalis. At the same meeting Professor Joseph Coats said that he was disposed to think that the tumour was on the whole more like a cancer than a sarcoma. It appeared to have originated in connection with a bronchus, and to have followed in its extension the course of the bronchial tubes, as is the habit of cancer. The microscopic appearances were not inconsistent with this view, though, after an examination necessarily cursory on his part, he did not wish to be dogmatic on this point. On the whole, I am inclined to agree with Professor Coats because, in addition to the histological argument he advances, the clinical features of the case corresponded in a surprising manner with those observed in the case of undoubted cancer recorded in my book.

LECTURE VIII.

A CASE OF THE SO-CALLED HYPERTROPHIC PULMONARY OSTEO-ARTHROPATHY OF MARIE, WITHOUT PULMONARY DISSASE.[1]

THE case which I now desire to demonstrate presents, in my opinion, most of the clinical features of the affection which Marie has designated hypertrophic pulmonary osteo-arthropathy. In this case, however, the term pulmonary might almost be omitted, for reasons which I will state after I have described the clinical characters.

The patient, a married man, aged 48, employed as a porter, was sent into my wards by my clinical assistant, Dr. Walter K. Hunter, on the 27th May, 1897, on account of progressive enlargement of the hands and feet, of about nine months' duration in all. On examination, a very striking alteration in the shape of the fingers, hands, wrists, and forearms is at once apparent. The fingers are thick, clubbed at the ends, with great incurvation of the nails, so that the free extremities of almost all the digits are covered by the bent nails and not by the skin. This is particularly the case in the thumbs, which present the "parrot's beak" appearance described by Marie (Fig. 25, p. 106). The enlarged extremities of the fingers resemble slightly the bulbous finger ends of phthisis, chronic

[1] This lecture was also read, and the various photographs, drawings, and diagrams illustrating it were shown at the meeting of the Section of Internal Medicine of the Twelfth International Medical Congress, at Moscow, on 25th August, 1897.

bronchitis, or cyanosis, but there is no wasting of the finger behind the bulbous point; indeed, the whole finger is thickened, particularly at the joints. The skin of the finger tips, though

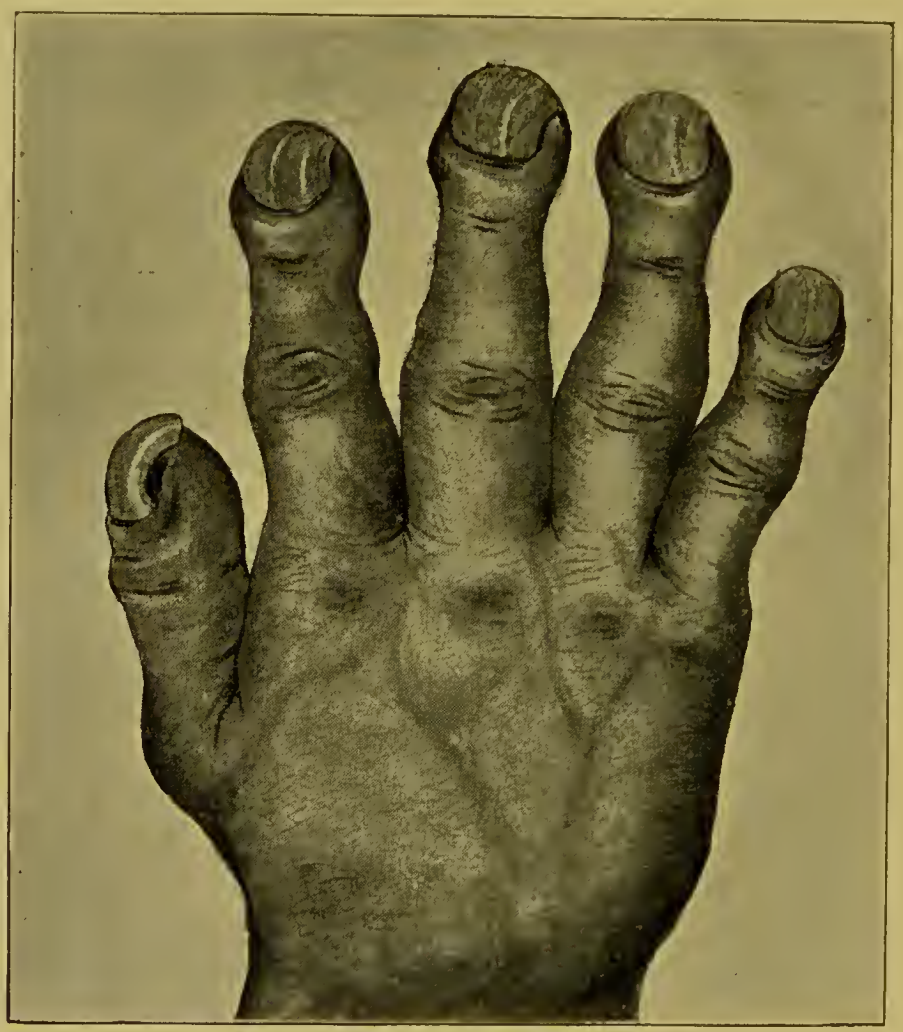


Fig. 25.

From a water-colour drawing of the right hand by Miss J. Effie Prowse, made immediately on admission. The curved condition of the nails, the bulbous finger ends, and the thickening of the proximal halves of the fingers are well shown. The superficial veins are also very prominent.

redder than that of the fingers generally, is not livid. The nails are not markedly striated, and are increased in length, but not greatly in breadth (Fig. 25, p. 106). The fingers are not obviously increased in length, and measurement shows

that the middle finger is barely $4\frac{1}{4}$ inches in length from the knuckle to the tip, a length which is not definitely greater than that of a normal hand. The whole hand has a thickened

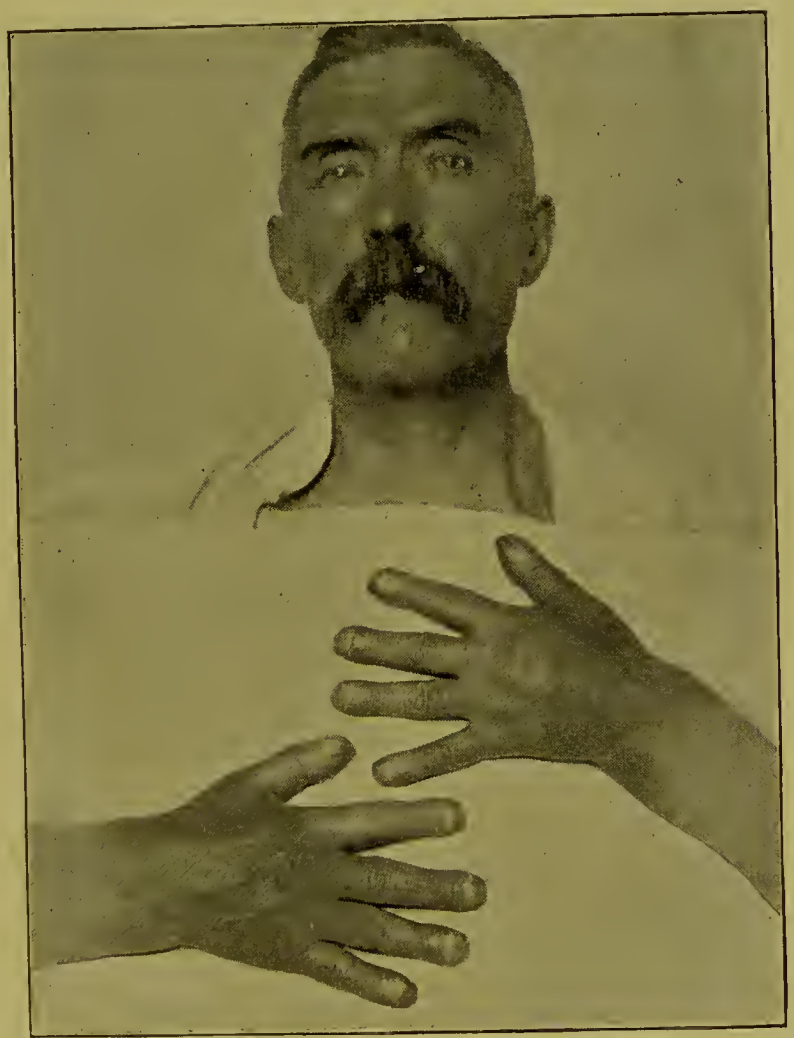


Fig. 26.

From a photograph by William Burns, M.B., after five or six weeks' residence. Shows the appearance of the face to be normal; the altered state of the hands; and the thickening of the lower portion of the forearm, particularly at the left wrist.

and hypertrophied appearance, the right being distinctly larger than the left. On admission, the circumference of the right hand at the metacarpo-phalangeal joints was $8\frac{3}{4}$ inches; of the left, $8\frac{1}{4}$ inches (Fig. 26, p. 107). The circumference

of the middle finger of the right hand at its second joint was $3\frac{1}{4}$ inches; of the left, 3 inches. On 5th July, 1897, the measurements were found to be the same. On account

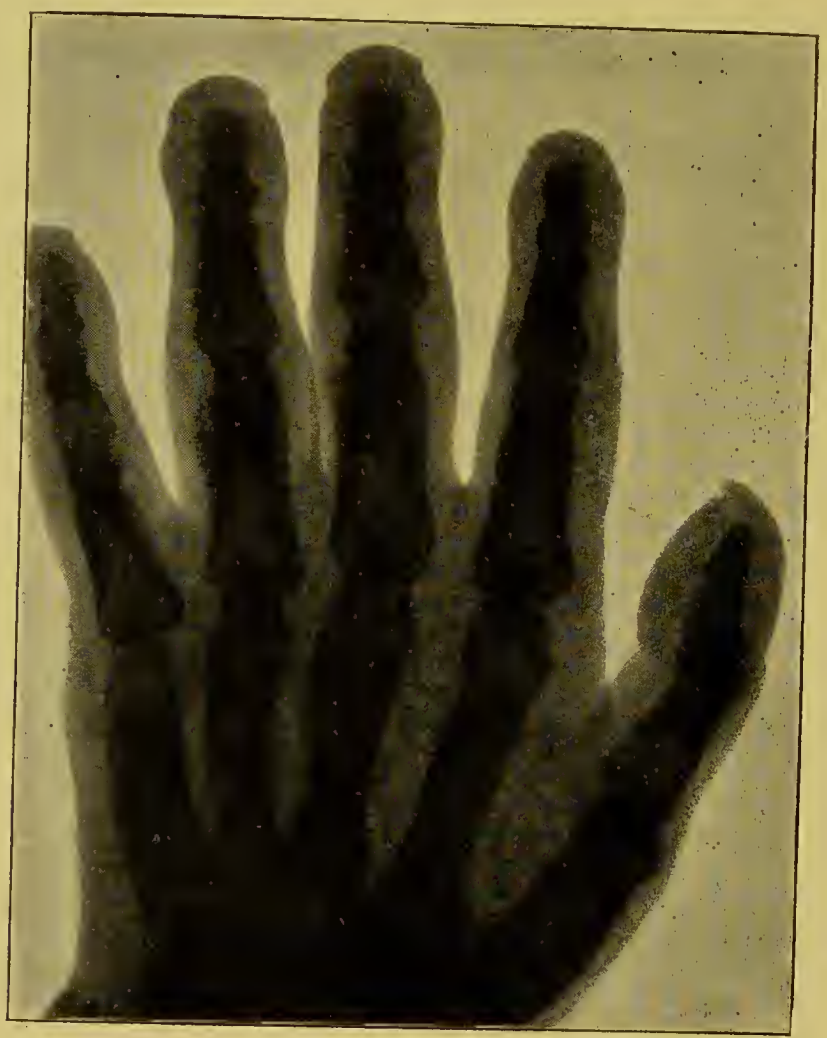


Fig. 27.

Skiagram of left hand by Dr. A. G. Faulds. Shows thickening of digits and metacarpal bones, due to subperiosteal new formation. This is particularly well seen in the bones of the middle, ring, and little fingers.

of stiffness and swelling of the fingers the right hand cannot be closed, the left only feebly. The metacarpal regions of the hands are, on the whole, less altered than the fingers and wrists, but a skiagram shows that in the metacarpal bones,

as well as in the phalanges, there is very distinct subperiosteal new formation of bone (Fig. 27, p. 108).

Hypertrophy of the distal extremities of the forearm bones

FIG. 28.

Skiagram of forearm by Dr. George Macintyre. Shows subperiosteal thickening of distal three-fourths of radius and ulna. There is also undue curving of the radius.

imparts a striking appearance of enlargement to the wrist-joints, which, with slight narrowing of the carpal region, reminds one a little of the deformity of rickets. The surface of the thickened bones is felt to be rough, and this thickening

and roughness can be traced quite up to the middle of the forearm, above which the bones again appear to be of normal size. The skiagram shows very marked subperiosteal forma-

Fig. 29.

From a photograph by Dr. William Burns. Shows the hypertrophied appearance presented by the feet and ankles. The malleolar region is greatly thickened. The unnatural condition of the finger points is also well shown.

tion on the radius and ulna, extending up the shafts for nearly three-fourths of their length (Fig. 28, p. 109). The wrist-joints are somewhat stiff, and the circumference of the right over the enlarged bones is 8¼ inches; of the left, 8 inches.

The form of the face presents nothing unusual, and in particular it is noted that there is no enlargement or deformity of the lower or upper jaw. The tongue is not enlarged.

FIG. 30.

From a photograph by Dr. William Burns. Profile view of the trunk. There is perhaps a slight tendency to kyphosis in the middle dorsal region. The thickened appearance of the wrist is well seen.

Sensibility to touch and pain in the upper extremities is normal, and the senses of taste, hearing, and smell seem to be quite normal. No retro-sternal dulness can be detected.

On examining the lower extremities, a hypertrophic con-

dition in all respects comparable to that in the hands and forearms is found in the feet and legs. The toes are distinctly bulbous; and there is great thickening of the lower ends of the leg bones, especially in the malleolar region (Fig. 29, p. 110). Pressure over the right malleoli causes very considerable pain. The circumference of the right ankle measures $11\frac{1}{4}$ inches; of the left, 11 inches; of the feet at the metatarso-

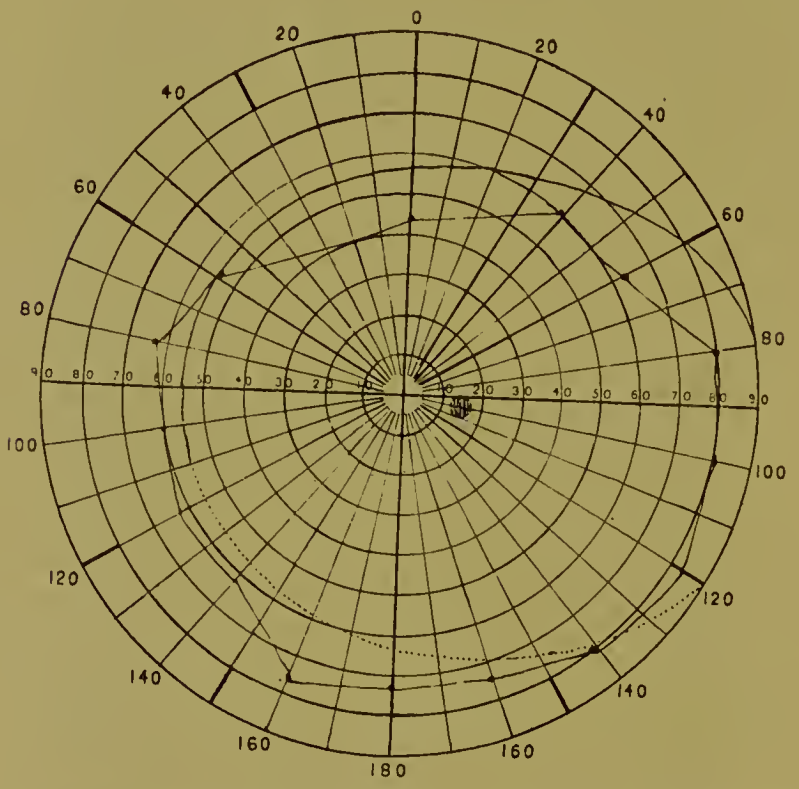


Fig. 31.

Perimetric tracing of right eye by Dr. T. K. Monro, 5th June, 1897; white light and bright day. Showing slight restriction of the temporal half field.

phalangeal joints, 10 inches. The sense of touch and pain in the lower extremities is normal. Patellar tendon reflexes are perhaps slightly exaggerated, and there is a slight tendency to ankle clonus. In walking he has lately experienced a very considerable degree of stiffness and weakness in the knees and ankles, particularly the former, so that he is no longer able to carry heavy weights as before. He has also had much pain in the knee-joints, which are considerably

swollen, and creak on being moved. He is a powerful man, and when he was well was able to carry a weight of 4 cwts.

No deformity of the trunk or of the spinal column is noticeable (Fig. 30, p. 111). The cremasteric reflex is normally present. He has never had any trouble with his bladder. His bowels are occasionally constipated, but during the latter part of his residence have been quite normal.

The urine has a normal amber colour, without deposit. The reaction is acid; the specific gravity, 1018; and no albumen, sugar, peptone, or blood has been detected. The daily average quantity of urine, however, has been all along very decidedly

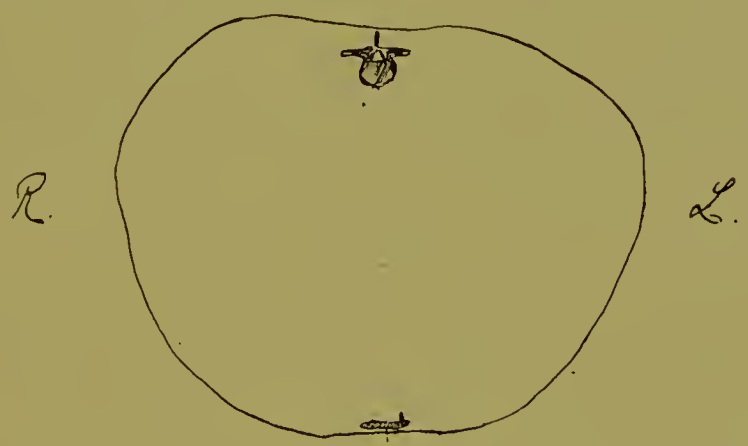


FIG. 32.

Cyrtometer tracing of chest about 1 inch above the level of the nipple. Shows slight inequality in favour of right side, but may be regarded as normal.

above the average. From 1st June to 29th July, 1897, the daily average quantity has been 76½ oz., and on eight days the amount reached 100 oz. or more.

The thyroid region presents nothing unusual. The lobes and the isthmus of the thyroid gland can be felt, but it cannot be said that there is either atrophy or hypertrophy of the organ.

On inquiry, it is elicited that he began to experience some dimness of vision about the same time that the changes in the feet and hands were first observed—*i.e.*, about nine months before his admission. For a careful examination of the eyes I am indebted to my clinical assistant, Dr. T. K. Monro, who

reports as follow:—"The pupils respond normally to light and in accommodation. With the right eye he counts fingers at 5, with the left at 4 metres. A rough test shows restriction of the temporal, but not of the nasal, half-fields. Perimetric tracings, likewise, show restriction of each field in its temporal half, whilst the nasal half is as good as the average, or even better, with white light (Fig. 31, p. 112).

"*Ophthalmoscopic Examination.*—The right disc has a certain woolliness of aspect all over, with an ill-defined margin, especially at the upper and lower parts, and to a less extent at the inner portion; it is relatively well-defined at the outer sides. Otherwise, the only noteworthy fact is slight fulness and tortuosity of the veins. The macular region and the fundus generally are normal. The left fundus presents, on the whole, similar appearances. Both discs are, if anything, somewhat hyperæmic, but they are not swollen."

The patient gives the following account of the affection which has just been described. About nine months before admission to the ward, having always previously been quite healthy and strong, he observed some enlargement of the hands and feet, unaccompanied by pain of any kind, but associated with dimness of vision, a symptom then experieneed for the first time. Three months later than this he began to experience pains in the fingers, particularly on attempting to bend them. On the whole, however, he paid little attention to the condition of his hands and feet till eight or nine weeks before entering the Infirmary, when he began to be troubled with severe pain in the ankles and knees, ultimately obliging him to give up work on account of his inability to carry weights or to go up and down stairs. He also suffered from pains in the wrists, particularly the right, and at times, also, in the shoulders. During his illness he has been much troubled with sweating of the feet, and in walking he feels as if a piece of cloth were interposed between the sole and the ground. He was inclined to think that the striking incurvation of the nails had been produced by pressure brought to bear on the points of the fingers while making up bales of goods at his work.

Four months before his admission he suffered from a severe cough, which, however, did not cause him to give up his work, and which had entirely disappeared about a month before he came into hospital. A minute and critical physical examination of the organs of the chest reveals absolutely no signs of disease. A cyrtometric tracing of the chest wall at the level of the fourth cartilage is characteristically normal (Fig. 32, p. 113). The lungs, especially, are found to be quite healthy, and he has had neither cough, spit, elevation of temperature, or any indication whatever of lung disease during the two months he has been under observation.

He suffers, however, from a chronic erythema of the face, with moderate desquamation, a condition which was present before his admission; and during residence he has also complained of flushings of the face. His chief trouble has been caused, while under observation, by pains in the knee-joints, worst when he is going about, and especially on going down stairs. There is no intellectual defect; and kyphosis is doubtful (Fig. 30, p. 111).

An examination of the blood shows rather more than the average number of blood corpuscles, and the hæmoglobin is about 80 per cent.

Family History.—There is absolutely no rheumatism, acute or chronic, in the members of his family. His father died at the age of 63, and his mother at 72. Of thirteen children born to them, eight attained adult life.

The case thus briefly described and fairly well illustrated by the photographs and skiagrams is certainly an unusual one. As to its essential nature no very definite or precise statements can be made. I have seen no similar case before, but there are three well recognised morbid conditions to which it may be supposed to bear certain relationships. These are—(1) acromegaly of Marie; (2) osteitis deformans of Paget; and (3) hypertrophic pulmonary osteo-arthropathy of Marie.

The only features of the case which seem to bear any resemblance to acromegaly are the slight defect of the temporal half of the field of vision and the excessive average daily quantity of urine. None of the other phenomena of

acromegaly seem to be present, and in particular the hypertrophy of the soft tissues met with in the deformed hands of acromegaly is absent.

The outstanding features of Paget's osteitis deformans are likewise not present in this case. There is no deformity of the skull, no pronounced curving or lengthening of the long bones, no deformity of the chest, and, so far as can be made out, no tendency to softening of the bones; indeed, the striking physiognomy of a well-marked case of osteitis deformans are entirely absent, although, of course, the progress of our case may not yet be sufficiently advanced for this. The lesion of the affected bones, however, as revealed by the Röntgen rays, is, on the whole, such as is described in Paget's disease, and there is perhaps slightly undue curving of the forearm bones; but the distribution of the lesion seems to be entirely different.

On the whole, I think the case may be taken as corresponding most closely to Pierre Marie's account of what he has designated hypertrophie pulmonary osteo-arthropathy. In all essential particulars, save one now to be mentioned, it conforms to the account of the deformity to which Marie has given this somewhat cumbrous name. The point of difference is that, in this man's case, there is, and has been, no chronic pulmonary or pleural affection. We are, therefore, unable, to explain the subperiosteal osseous growth causing the deformity described as the result of the absorption of poisonous toxines from diseased lung or pleura acting injuriously and "selectively" upon the nutrition of the bones. Neither can we suppose with Thorburn that the affection is due to a chronic diffuse tuberculosis of bones, there being absolutely no evidence of tubercle in our patient, who, indeed, except for his bone affection, is a remarkably healthy-looking man.

The clinical characters and the skiagrams show that the deformity has been produced by a subperiosteal formation of bone in the deformed parts. What the cause of this has been it is impossible to say. Syphilis can be excluded. The patient denies that he has ever had venereal disease, and there is no evidence of syphilis upon his body.

The only hypothesis I can advance is that the disease in

this case may be rheumatic in its essential nature, notwithstanding the circumstance that none of the classical deformities associated with chronic rheumatic arthritis are present. The pain over the thickened bones, the creaking of the knee-joints, and the pains complained of at different times in the shoulders, knees, and ankles, are all in favour of this view. On the other hand, however, it is to be noted that the skiagram of the wrist shows the carpal bones to be unaffected.

Treatment has, on the whole, been very ineffectual. At first he was put upon thyroid gland, with the effect of reducing his weight half a stone in a fortnight, but with no influence on the affected parts. Latterly he has been treated by alkalies, by massage, and by saline baths, with alleviation of his pain and a possible arrest of the progress of the affection. Before leaving the hospital the hands presented, on the whole, a more normal appearance, and he could completely close the right, a thing quite impossible to him on, and long after, his admission.

For the photographs I am indebted to my house physician, Dr. William Burns, and for the skiagrams to Dr. Faulds and Dr. George Macintyre. The water-colour drawing of the right hand (Fig. 25, p. 106) was made for me by my pupil, Miss J. Effie Prowse.

[This man was readmitted to the ward in November, 1897, but no essential change in his condition falls to be recorded. He still complained of rheumatic pains, particularly in the shoulders and knees; and the state of his hands and feet was very much as described in the lecture.]

LECTURE IX.

FOUR CASES OF MUSCULAR ATROPHY.[1]

THE four cases of muscular atrophy, which are recorded in this lecture, are of interest from several points of view. It is unusual in general medical wards to have so many cases of this kind under treatment at the same time. With regard to diagnosis, the cases raise interesting questions as to classification and pathology. On the whole, it may be admitted that the first two to be shown are examples of the usual form of progressive muscular atrophy associated with degenerative changes in the anterior cornua of the spinal cord. With regard to the last two, however, there is room for doubt as to whether they are to be regarded as of spinal origin. On the whole, the features they present seem rather to point to a primary affection of the muscles themselves. All of them have been subjected, for lengthened periods, to treatment by the hypodermic injection of strychnine; and although two of the patients have expressed themselves as being distinctly benefited both in general health and muscular power, it may be doubted whether actual improvement or arrest of the disease has taken place.

For the details of the clinical reports of the cases, and for the interesting speculations as to the pathology of Case III, I am indebted to my clinical assistant, Dr. T. K. Monro, without whose help I could not have submitted them to you with such minute accuracy as to the clinical phenomena.

[1] Delivered as a series of clinical demonstrations on the individual cases in December, 1896, and January, 1897.

Case I. *Spinal Muscular Atrophy involving the Right Hand.*—Robert M., æt. 42, labourer in a finishing shop, noticed wasting in the first interosseous space of his right hand about the end of August, 1896, and felt weakness in the same part two or three weeks later. He came to the Dispensary of the Royal Infirmary early in October, but got progressively worse, and was therefore admitted to the ward in the latter part of November. He was thereafter treated by daily hypodermic injections of strychnine, and in the course of two or three weeks he became aware that his hand had ceased to get worse as regards either strength or bulk.

So far as can be made out, the wasting is confined to the intrinsic muscles of the right hand. Wasting is conspicuous in the posterior aspect of all the interosseous spaces, and is seen to a less extent in the palm and thenar eminence, the hypothenar eminence not being obviously affected. The fingers maintain to a slight, but quite distinct, degree the attitude due to the long flexors and extensors being imperfectly opposed by the interossei and lumbricales (over-extension of metacarpo-phalangeal with flexion of interphalangeal joints). The thumb can be opposed to the second, third, and fourth digits, but not always to the fifth. Adduction, abduction, and flexion of the thumb are preserved in considerable measure. The power of grasping is much reduced. Patient has not noticed twitchings of the muscles of the hand, but fibrillary tremors are very conspicuous in the right fore-arm and upper arm (including the deltoid region), and are occasionally to be observed also about the left shoulder and upper arm. The tendon-jerks are well marked all over the body, including the affected upper limb. Ophthalmoscopic examination normal. Pupils medium and equal, contracting directly and consensually to light, and contracting also in convergence. There is well-marked unrest of the pupil, making it difficult to appreciate any little dilatation that may be caused by stimulating the skin of the neck.

Patient is disposed to attribute his ailment to heavy work. He had erysipelas four years ago.

Case II. *Spinal Muscular Atrophy involving the Fore-arms and Hands.*—Peter P., joiner, aged 53, but in appearance much older, began to feel coldness in his right hand about fourteen months ago. Weakness set in a few weeks later. Several months afterwards, the left hand became affected, and about the same time patient began to feel his left foot or ankle weak. With regard to the hands, he noticed the loss of strength before the wasting. He does not know of any cause for his ailment. He became progressively worse until admission in December, 1896, but since then has improved a little, he thinks, under treatment by strychnine hypodermically and arsenic internally.

Weakness and wasting are manifest only in the fore-arms and hands, and are more marked on the right side. The principal muscles involved in the fore-arm are the ext. carp. radialis longior and brevior, and to a less extent the ext. com. digit., and perhaps the flex. carpi ulnaris. The supinator longus, the other flexors and the extensors of the elbow, the flexors of the digits, the flex. carp. radialis, palmaris longus, and ext. carp. ulnaris are preserved.

So far as the hands are concerned, the muscular loss is severe. The fingers assume the claw-like attitude on account of the long flexors and extensors being no longer opposed by the interossei and lumbricales. There is practically no power of adduction or abduction of the four inner digits. The back of the thumb lies in the plane of the back of the hand, or even behind it, so that the hand resembles that of an ape (ext. sec. internod. poll., imperfectly opposed by thenar muscles). The right thumb can be slightly adducted and abducted, but cannot be opposed to any finger of the same hand. The left thumb can be moved in greater measure to and from the hand, and can be opposed to the fore and middle fingers. There is almost no flexion or extension of the right thumb, but the distal joint of the left thumb can be flexed very well.

Patient lifts the left foot higher than the right in walking. There appears to be slight wasting in the left leg, the maximum girth of the left calf (12¼ inches) being half an inch less than that of the right.

The tendon-jerks are well-marked over the body generally, but are not so distinct in the right fore-arm as in the left. There is no ankle-clonus. The plantar reflex is preserved, but the superficial reflexes generally are not well marked.

Frequent fibrillary tremors are observed in both fore-arms and upper arms, and in the left thigh; and similar tremors occur, though not so continuously, in the right thigh, in both legs below the knees, and over both scapulæ.

Electrical irritability of some of the affected muscles is greatly reduced. Thus, no response was obtained in either hand to faradism, although frequently in these examinations of the hand the long muscles of the fore-arm contracted. Some response to galvanism was obtained from the interossei, and the quality was not always normal. Thus:—Right abductor indicis—K.C.C. with 5 ma.; A.C.C. with 1 ma. Left abductor indicis—K.C.C. with 3 ma.; A.C.C. with 12 ma.

Patient is rather unsteady when he attempts to stand with feet together and eyes shut.

The pupils are equal and somewhat small; each contracts directly and consensually to light. Ophthalmoscopic examination normal.

Nothing of importance is ascertained in connection with the patient's personal history, but a brother died with palsy of the left side, and another became insane and died in Woodilee Asylum. Patient denies having had venereal disease.

Case III. *Widely and Irregularly Spread Muscular Atrophy, probably Myopathic (? Erb's "Juvenile" Type), with a definite Clinical History of severe crushing Injury of the Trunk.*—John B., a miner, aged 28, was admitted to Ward 7 on 19th September, 1896.

About eight years ago, he got severely crushed in the pit, the arms being squeezed against the sides of the chest, and the pressure affecting the whole length of the trunk. He was unable to work, in consequence of this accident, for five or six weeks, during which time he had a general feeling of soreness, with pain in the small of the back, and a sense of weight

in both shoulders. There was no pain in the back of the neck after the accident, and the doctor said that no bones were broken.

He never recovered completely from the accident; indeed, the weight on the shoulders became worse, and after he resumed his occupation the shoulders became very painful while he worked. Nearly a year elapsed after the accident before he recognised that he could not lift his arms properly. This weakness slowly increased, but, by changes in the nature of his occupation, he was able to work for his living until March, 1896.

The legs first began to give trouble four years ago, at a time when he was working constantly in water; he used to get wet up to the waist. Weakness in the lower limbs (causing great difficulty, for instance, in going up and down stairs), and violent and painful cramps in the thighs and calves, particularly on the right side, began at this time; and weakness increased up to the date of admission.

He strained his back sixteen or seventeen years ago by lifting too heavy a weight in play, but recovery seems to have been practically if not absolutely perfect. Since the crush, however, the back has not been right, and some time after the accident it began to get quite evidently weaker, until he became unable to raise himself after stooping.

With respect to the sense of weight in the shoulders, the power of the legs, and the power of the back, he has improved very greatly since admission.

Patient has had pain in the sacral region, near the middle line of the back, not continuous, but lasting it may be for days at a time, and then absent for days, and sometimes so severe that he could not allow the part to be touched. This began before the weakness of the legs. He has also suffered from shooting pains about the highest portions of the iliac crests. Further, he has had momentary shooting pains along the thighs down to the knees; these are rather severe, and make him fall down on his knees. He has still pains across the "top of the hips" once in two or three days, but these are not severe. There has been no pain in the upper limb, except

what has been already indicated as occurring in the shoulders. There is no ataxy on standing. Patient states that the senses of touch, temperature, and pain, have never been impaired. Smell, taste, and hearing are preserved. The stomach and bladder act normally. The bowels are somewhat costive. Influenza last year, and again in the spring of the present year, is the only illness he has had apart from the present one. It is to be noted, however, that on one or two occasions during his residence he suffered from an acute inflammation of the skin of the legs, rather suggestive of erysipelas. He has had a number of brothers and sisters, but no relative has suffered from any illness similar to his own. Alcoholic excess and venereal disease are denied.

Both fundi are normal. Pupils medium and equal. Each contracts directly and consensually to light, contracts in convergence, and dilates reflexly. There is no nystagmus, strabismus, or diplopia. The facial, masticatory, and lingual muscles act normally. The movements of the head upon the trunk are normal. The diaphragm acts normally.

When patient stands with his arms hanging by his sides, the scapula is rotated, so that the acromion process is displaced downwards, and the lower angle inwards and upwards.

Both trapezii have disappeared, so that the form of the neck as viewed from behind is altered, the change being specially manifest when the shoulders are elevated. The rhomboids are powerful; the right rhomboideus major appears to be actually hypertrophied. The levator anguli scapulæ is well preserved on the left side, but has suffered considerably on the right side.

When patient is in the erect posture, and the upper limbs are extended horizontally, there is very little pushing power (serratus magnus) on either side. In order to push, patient inclines his body forwards, so as to get the upper limbs more into line with his trunk. When the arms are crossed in front, the lower angle of the scapula is very prominent, and a deep groove is seen behind the inner border of the bone.

The middle portion of the deltoid on either side remains

strong, but the anterior and posterior parts are wasted. The part of each muscle that is preserved is very firm, and in the case of the right perhaps hypertrophied.

The supraspinatus, infraspinatus, and apparently also the teres minor are powerful on both sides. The infraspinati are hypertrophied and firm.

The subscapulares are probably active, since the humeri can be rotated inwards as well as outwards.

The latissimi dorsi are much impaired, but not lost. Their bulk is not appreciable to the eye, and there is very little of an axillary fold, either anterior or posterior, but patient is able to put his arms behind his back.

The pectoralis major is lost in great measure, but not absolutely. The wasting is pretty generally distributed throughout the muscle.

When an attempt is made to lift up patient by placing the hands under the armpits, his shoulders go up to the sides of his head (weakness of latissimi and pectorales).

The teres major is weakened on either side. Very little power remains to either triceps.

Flexion of the elbow can practically not be done against gravity.

The supinator longus and extensor carpi radialis longior have disappeared on both sides. The wasted muscles which act on the elbow-joint are flabby.

Supination and pronation of both fore-arms are well carried out. The bulk of the fore-arms (when allowance is made for the loss of the two muscles just mentioned) and of the hands is well maintained.

Flexion of the wrists is preserved. Extension of both wrists is impaired in some degree, although the right wrist can still be extended to beyond the plane of the fore-arm, and the left still further. Lateral movements of the wrist can be carried out.

Flexion of the metacarpo-phalangeal, with extension of the interphalangeal joints (interossei and lumbricales), is preserved, but there appears to be, in the case of each hand, some weakness of the action of the long flexor on the distal phalanx.

The lateral movements of the digits are impaired, though not lost.

Extension of the thumb and first two fingers is impaired, especially in the right hand.

There is slight weakness of the right extensor secundi internodii pollicis, but the left appears to be strong.

Patient is able to oppose his thumb to each of the remaining digits of the hand.

The hands are cold and livid in winter. Patient is able to write quite well, and to feed himself. The grasping power, as ascertained by the dynamometer, is — in the right hand, 16 kilos; in the left, 12 kilos.

When patient lies on his back and raises his head, the lower part of the thorax becomes flattened anteriorly, and a groove develops under each lower costal margin (weakness of lateral abdominal muscles).

The gait has not much of a waddling character now. Patient walks with his feet sufficiently close together. Lordosis is the principal thing noticed as he walks, and this deformity becomes still more striking when he rises from sitting. He says his right foot tends to drag, so that the toes are readily caught by any obstacle, and he is apt to fall on his knees, but no high stepping is noticed as he walks.

Formerly he required to put his hands on his knees to enable him to rise from sitting, but after a fortnight's residence in hospital this ceased to be necessary.

Abduction of the left thigh is carried out well; of the right not so well, the body swinging far over to the left. There is wasting of the left buttock, which is flattened and soft, whilst the right is firm and of normal shape. The wasting appears to be chiefly of the gluteus maximus. On the other hand, the right thigh is softer and thinner than the left.

Circumduction of the thigh is preserved on the left side, but not so fully on the right.

Flexion of the left hip is strong; of the right not so strong.

Extension of either hip is preserved, and the thighs can be crossed.

The knees can be flexed and extended.

The calf muscles, especially on the right side, are large and powerful, probably hypertrophied. The maximum girth of the right calf is 15 inches, and of the left, 14 inches. Patient easily stands on tiptoe.

The left ankle can be flexed and extended, but flexion of the ankle is almost impossible on the right side. The right anterior tibial muscles are less bulky than the left.

The toes can be flexed and extended.

The plantar, abdominal, epigastric, and cremasteric reflexes are obtainable. The knee-jerk is greatly reduced, but has been obtained since admission by making patient lie on his back with the sole of the foot on the bed.

No fibrillary tremors have been observed.

The senses of touch, pain, and temperature are normal.

Nothing abnormal has been detected in the heart, lungs, or kidneys. The temperature has been normal or subnormal throughout, and the weight has remained nearly constant (about $9\frac{1}{2}$ st.).

A scaly patch is present over the left tibia below the patella (? psoriasis). Patient suspects it was there before he was injured.

Electrical investigations of the affected muscles (by Dr. George M'Intyre) have shown a quantitative diminution of excitability to both galvanism and faradism, but no qualitative changes.

The treatment has been by electricity, and by tonics internally, and latterly by strychnine hypodermically.

Patient is thoroughly satisfied, and so are others who have observed him, that he has distinctly improved since his admission. So far as muscular power is concerned, however, this is only in the sense that he can now do things that he could not do before; there is no evidence as yet that lost muscular tissue has been restored.

The history of the preceding accident, the pains, the isolation of the case in patient's family, and perhaps it may be added the age at which the disease commenced, might suggest the presence of some chronic lesion in the spinal cord. On the other hand, the wide-spread and irregularly distributed muscular

atrophy; the weakness and wasting of the latissimi and pectorales, in association with the great strength and size, amounting even to hypertrophy, of the infraspinati and calf muscles; the severity of the affection in the girdles and proximal segments of the limbs with the relative immunity of the distal portions; the quantitative diminution of electrical irritability without any qualitative change; the great diminution of the tendon reflexes; the absence of fibrillary tremors; and the normal condition of sensation (except as regards the pains described), of the sphincters, eyes, and internal organs, make a tolerably accurate picture of a case in which structural changes are confined to the muscles themselves.

Whilst it is true that the different forms of muscular dystrophy run into one another, four principal types have been recognised: pseudo-hypertrophic (Duchenne), hereditary (Leyden), juvenile (Erb), and infantile (Duchenne) or facio-scapulo-humeral (Landouzy and Déjérine). The pseudo-hypertrophic and infantile forms commence, in characteristic cases, in childhood, and are associated, the former with pseudo-hypertrophy, and the latter with involvement of the face. In the case now under consideration, the face is normal, and any hypertrophy that is present appears to be true and not false, for the muscles that are specially large are also powerful. Leyden's hereditary type begins in the lower limbs and sacral region, whereas in the present case the lower limbs did not suffer till some years after the affection had invaded the upper limbs or shoulder girdles.

Probably, therefore, this case should be regarded as belonging to the "juvenile" type. The age is quite consistent with this view.

A few other points may be noticed. Pains are a rare feature of the disease. The disease is generally slowly progressive, but sometimes becomes stationary, and a certain degree of improvement, though exceptional, has been repeatedly observed. It is certainly interesting to watch the agility with which this patient, with his wasted muscles, can rise from the recumbent, sitting, or kneeling posture. It is noteworthy also that he has got over the necessity for putting his hands on his knees

to enable him to rise from sitting, and, further, that this habit seems to have been acquired in adult life. Finally, it is of interest that of a number of brothers and sisters, he alone suffers from this disease. The influence of the injury, described above, as a causal factor cannot be disregarded.

Case IV. *Pronounced Muscular Atrophy of very Limited Distribution.*—Maggie L., aged 18, employed latterly in a thread work, was admitted on the 29th December, 1896, complaining of inability to raise her right arm completely. Two years ago, her mistress remarked to her that her right shoulder-blade stuck out too far; but she dates her illness as far back only as the beginning of May, 1896, when, after carrying a heavy chest for a considerable distance, she felt pain in the affected limb from the top of the shoulder to the elbow. She is still liable to frequent soreness in the same parts. Difficulty in performing some parts of her work in the thread factory, and in doing up her back hair, has been present since about the time mentioned, and got worse up to the time of admission. The treatment has been by arsenic and bitters, and from the 5th January, 1897, by strychnine hypodermically. Patient thinks (11th February) she has been improving during the last ten days.

She is disposed to attribute her ailment to the carrying of the heavy weight, and there is nothing in her personal history to suggest any other cause. Her parents and her three brothers and five sisters are all alive and well. A brother and sister are older than she. The eldest of the family is 23, and the youngest 6. No relative has any complaint similar to that from which patient suffers.

The disease appears to be confined to a very few muscles. The right trapezius seems to be entirely absent, and the right serratus magnus has suffered considerably. The girl retains a good deal of pushing power (serratus magnus) on the right side, but when she pushes, the inner border of the right scapula projects far backwards, so as to give rise to a deep vertical groove. There is room for a slight suspicion that when she pushes with the left hand the inner border of the

left scapula projects a little further than it ought to do. The sterno-mastoid, latissimus, rhomboid, levator anguli scapulæ, pectoralis, deltoid, supraspinatus, infraspinatus, teres minor, teres major, and subscapularis all act in a normal manner.

The rhomboids on the right (affected) side respond readily to a tap with the finger; those of the left side do not. No fibrillary tremors are seen. The pupils are large, and respond readily to light. Ophthalmoscopic examination reveals normal conditions.

The cases just described were also demonstrated at a meeting of the Glasgow Medico-Chirurgical Society on the 22nd January, 1897, when Dr. Alexander Robertson expressed his opinion that the first two cases were undoubted illustrations of progressive muscular atrophy due to the usual degenerative changes in the anterior cornua of the spinal cord. The last two cases he was more doubtful about, but, on the whole, thought that they were probably myopathic rather than spinal in origin, and perhaps injury, as detailed in the reports, may have been of some etiological importance.

[Case I was readmitted to the ward in November, 1897. His disease was evidently making rapid progress, and after a further course of hypodermic injections of strychnine, he was dismissed not improved. The fibrillary tremors were on the whole more marked than during his previous residence, especially in the left arm and shoulder.]

LECTURE X.

A CASE OF SCLERODERMA, LEADING TO PRONOUNCED HEMIATROPHY OF THE FACE, BODY, AND EXTREMITIES, WITH DEFORMITY AND FIBROUS ANKYLOSIS OF THE JOINTS, AFTER A LENGTHENED PERIOD OF SUPERFICIAL ULCERATION.[1]

THE case of Martha F., aged 24, unmarried, who was admitted to Ward 8 on 4th February, 1897, and whom we have frequently examined together in the course of our ward visits, has been more or less under my observation, both in and out of the hospital, for a period of about eleven years. As illustrating the relationship of that somewhat rare disease, scleroderma, to the equally uncommon affection, hemiatrophy of the face and body, I propose to make the case the subject of detailed study in this clinical lecture. The notes recorded in our Ward Journal are of considerable length, and we may approach the study of the clinical phenomena best by describing her present condition before considering the history of the changes that have led up to it.

The patient, who is a fairly well-nourished young woman, is now the subject of a very striking deformity, the chief characteristic of which is a marked atrophy of the whole right side of the body, more particularly affecting the face,

[1] Delivered Friday, 2nd April, 1897. For permission to reprint this lecture from the *International Clinics*, vol. ii, seventh series, 1897, I am indebted to the kindness of Messrs. J. B. Lippincott Company, of Philadelphia, U.S.A., to whom I desire to express my thanks.

arm, and leg, associated also with alterations in the condition of the skin, which are not so strictly limited to the right side of the body.

The atrophy of the right side of the face is very pronounced, being most marked on the chin and forehead. The right side of the lower jaw is markedly diminished in length and thickness, and there is a distinctly visible depression of the surface over the right temple and side of the frontal bone, the depression of the forehead, however, not beginning quite at the middle line, but a little to the right of it. The skin of the forehead and temple, as far down as the level of the external meatus, has a slightly brownish colour, and a somewhat parchment-like consistence. The hair is not affected either in texture or in colour. The tongue presents a quite healthy appearance, and there is no unilateral atrophy. Cutaneous sensibility and taste are quite unaffected, and are equal on both sides; but the sense of smell is perhaps a little deficient in both nostrils. No anomalies of cutaneous transpiration have been observed on the affected side.

The wasted condition of the right arm and hand is associated with a peculiar claw-like deformity of the fingers, which are fixed in a position of over-extension of the metacarpo-phalangeal joints and of flexion of the intra-phalangeal joints. The skin is tightly bound over the phalanges, and, except for the pink colour of the integument, the hand is like that of a mummy. There is still slight power of abduction and adduction in the forefinger, but of very limited range. The forearm is fixed at a right angle to the upper arm and the skin is tightly bound to the bone at the elbow-joint, all the bony processes projecting sharply beneath it. Exceedingly limited movements of flexion and extension are still possible in this joint, so that the ankylosis is not absolutely complete, and is probably fibrous. Three inches above the tip of the elbow the right upper arm measures $4\frac{1}{4}$ inches; the left, $6\frac{1}{2}$ inches. At the middle of the forearm the right measures $3\frac{1}{2}$ inches; the left, $5\frac{1}{8}$ inches. The movement of the shoulder-joint is fairly free, but there is a very striking hide-bound character of the skin covering

it, so that all the bony prominences are plainly visible. There is very marked atrophy of the upper portion of the deltoid, only a few fibres of this portion of the muscle remaining. Extending from the middle of the back of the upper arm down the back of the elbow and forearm to the dorsum of the hand there is a chain of depressed cicatrices, the surface of which presents a shining pink appearance, with here and there radiating hair-like capillaries, occasionally reminding one of mother-of-pearl. On the inner and anterior aspects of the upper arm and forearm the skin is healthy in character, and the underlying tissues are of normal softness.

The right mamma is smaller than the left. On the surface of the abdomen the skin presents a brownish colour, reminding the observer of old wax or parchment. On pinching the pigmented skin great atrophy of underlying tissues is at once appreciated. This change is most marked in the right iliac region, where it is continuous with a similar condition in Scarpa's triangle and the inner aspect of the thigh. Towards the left the pigmentation of the skin extends in an irregular fashion obliquely upward to terminate in the left axilla, the oblique line of pigmentation being on an average about an inch and a half in breadth. The hide-bound character is not so marked on the front of the abdomen, but the skin is tightly stretched over the anterior spinous processes of the right ilium. The pigmented areas are also slightly depressed below the level of the surrounding skin. The skin of the front of the thorax is not very abnormal in character. Posteriorly atrophy of the right side of the trunk is much more obvious, particularly in the scapular and dorsal regions, where the skin is parchment-like, with marked atrophy of subcutaneous structures. Atrophy is also observed on the right side of the back of the neck.

In the right lower extremity a similar condition to that observed in the right arm is present. The bony prominences of the knee project beneath tightly-stretched skin. At its thickest part the right half measures 7 inches; the left, $11\frac{3}{4}$ inches. At its middle the right thigh measures 13 inches;

the left, $16\frac{3}{4}$ inches. The skin of the front of the leg is the seat of a chain of depressed cicatrices, with white, shining, mother-of-pearl-like surfaces, extending from about $2\frac{1}{2}$ inches below the patella to the root of the toes. The three inner toes are over-extended on the dorsum of the foot. The skin of the sole and over the calf muscles is practically normal, and the patient can walk without difficulty. The right foot, round the ball of the toes, measures $5\frac{5}{8}$ inches; the left, $7\frac{1}{2}$ inches. On the dorsum of the right foot there is a red and leeting condition of the hide-bound skin eczematous in character.

Cutaneous sensibility is everywhere preserved, even in the shrivelled fingers and toes. Since her admission the urine has been examined on many occasions, and a trace of albumen has always been found. There is, however, no increase in the daily quantity excreted, and no hæmoglobinuria has ever been observed. Temperature has been normal or subnormal throughout; appetite has been rather poor, perhaps owing to a difficulty of swallowing, to which I will direct your attention immediately; the bowels have been rather constipated; but, on the whole, the general health may be described as fair.

On the dorsum of the left foot there is a small, elongated patch of yellow shining skin, and a similar condition is observed around the vaccination mark on the left upper arm. In the dorsal region of the back, immediately to the left of the spines, there is a strip of altered skin about half an inch in breadth and 6 inches in length. The fingers of the left hand are slender and tapering, and their integument is perhaps slightly stretched. On the dorsum of this hand an irregularly-shaped area of atrophied skin is also present, and the movements of the fingers are slightly interfered with in the way of opening and closing the hand. With these exceptions, and that already mentioned as affecting the left side of the abdomen and chest, the skin of the left side is normal, and there is no atrophy of this side of the body, except in the case of the left hand, which is small.

Having thus described the deformity as it at present exists,

I have now briefly to relate the clinical history of the disease. The patient first came under my care in the Dispensary of the Royal Infirmary on the 29th of January, 1886, about two months after the onset of the disease. In the *Glasgow Medical Journal* for October, 1886, I published a brief account of the case as then observed, and from the notes then made I now extract a few historical particulars. About two months before coming under observation the child drew her mother's attention to a hard patch of skin in the right groin, and about the same time the right hand was noticed to be swollen and stiff. About six weeks later similar patches of hardened skin were discovered on the right shoulder and upper arm. Though always healthy enough, she had never been very robust, and the only point of importance in her previous history was the fact that three years before the onset of her disease she had taken by accident some vitriol, which had made her very ill, and left a difficulty in swallowing any but very soft food, a difficulty which still persists. Menstruation was established between 15 and 17 years of age, and since then has been quite normal.

In January, 1886, the right hand was found to be much swollen and of a "blae" colour, pitting on pressure, the fingers being somewhat stiff, but capable of movement. The hand was very cold, as was likewise the foot. Patches of hard, pigmented, adherent skin having all the characters of typical scleroderma were found on the right shoulder, arm, and forearm, on the right iliac region, and on the right lower limb, for the details of which I must refer you to the account published in 1886. The heart and lungs at this time were found to be healthy. Further notes of her condition were made on the 17th of August and 10th of September, 1886. On these occasions it was noted that the hide-bound character of the skin was making progress, and that the affected areas were liable to be covered with crusts as if from exudation, but no ulceration had at this time taken place. Fixation of the fingers and elbow-joint was then commencing, and on the 10th of September, 1886, a patch of scleroderma was for the first time observed on the right temple, evidently the starting-

Fig. 33.

Martha F., showing atrophied condition of the right arm and leg as well as of the right side of the face and body.

point of the hemiatrophy of the face, now such a pronounced feature of the case. It was further at the same time noted that the sensibility of the affected skin was quite unimpaired. Her general health also was fairly maintained.

During the following years I visited her on a number of occasions at her own home, and witnessed the extensive and prolonged though superficial ulceration of the skin, which ultimately under appropriate dressings healed, leaving the wide-spread cicatrisation of the integument of the arm and leg which has already been described. At her own home I made lengthy notes of her condition, which you will find in full in the Ward Journal, on the 26th of January, 1887, the 12th of August, 1888, and the 8th of July, 1890. During these years the chief clinical feature was the superficial ulceration of the skin of the right arm and leg, associated with a progressive atrophy of these limbs. In 1887 the ulceration was confined chiefly to the leg; in 1888, to the arm and forearm; and in 1890 ulcers were found both on the arm and leg. The last of these ulcers healed up in 1892, so that the ulcerative process lasted for the long period of about five years. The affected skin of the thigh, abdomen. shoulder, and face never ulcerated, and has on the whole, during the last few years, undergone but little change. The claw-like deformity of the right hand was fully developed in January, 1887, but definite hemiatrophy of the face, affecting the bones as well as the soft tissues, was not noted till July, 1894.

On the 6th of July, 1894, the patient was admitted to Ward 10, under my care, on account of difficulty of micturition, requiring the occasional use of the catheter; the dysuria was caused by ulceration affecting the vulva, the cicatrices of which are still to be seen on the right side, although both labia were affected. I again entered in the Journal lengthy notes of her condition, but the record contains practically nothing to add to the description which has already been given. At this time the photograph I now show you was taken by my colleague, Dr. Charles Workman, and it illustrates fairly well her condition to-day (Fig. 33).

It cannot be said that the family history throws any light upon the case. Her father died at the age of 63, after three years' illness, charaeterised by cough and hæmoptysis. Her mother is alive, but suffers from bronchitis in the winter time; the mother is the subject of a shrivelled and cicatrieial condition of the right upper arm, the rcsult of a severe deep burn in childhood. The affeetcd part of the arm bears a superfieial rescmblanee to the condition of her daughter's upper arm. One sister is alive and well, aged 28. Two sisters and a brother died in early ehildhood.

As regards the primary affection of the skin in this case, there can be no reasonable doubt that it presented all the typieal eharacters of the discase known as seleroderma or selerodermia, and at first no other view as to its ultimate nature was entertained. Of this disease I had previously seen two examples. One of these, in many respeets similar in its mode of onset to that now recorded, was under the care of Professor M'Call Anderson, in the Western Infirmary, while I was his house physieian. Of this case, with Dr. M'Call Anderson's permission, I published notes in the *Glasgow Medical Journal* for Mareh, 1881, vol. xv, N. S., p. 221. The second case was under the care of Dr. James Finlayson, who reported it in detail in the *Medical Chronicle*, vol. i, 1885, p. 315. Of the skin affeetion *per se* it is unneeessary to pursue the study further, and for additional information on this subject I must refer you to works on dermatology and speeially to Unna's *Histopathology of the Skin*. It will suffiee if I finish this part of the leeture by expressing my opinion that in the case we have been studying the scleroderma may be regarded as having undergone a spontaneous eure, although it has left behind the very striking deformity which you have seen.

The interest of scleroderma to the general physician, however, lies in the relationship it bears (1) to the "symmetrieal gangrene of the extremities," known as Raynaud's disease; and (2) to the development of hemiatrophy of the faee and body. With regard to the first of these relationships the ease published by Dr. James Finlayson (*loc. cit.*) is perhaps one of

the most valuable on record, and as such has been referred to by Dr. Thomas Barlow in the appendix to his translation of Raynaud's paper on "local asphyxia" (*New Sydenham Society*, vol. cxxi, p. 190). In Favier's thesis (Paris, 1880, No. 166) on this relationship, for access to which I am indebted to Dr. Finlayson, cases are given in which gangrenous ulcerations occurred, but none were so characteristically gangrenous (*i. e.*, the seat of dry, black gangrene) as in Dr. Finlayson's case. During the clinical course of our case any relationship to Raynaud's disease never suggested itself to me, nor do I now think that the long-continued and markedly unilateral ulceration already described can be regarded in any proper sense as of the essential nature of Raynaud's gangrene. On consulting my notes, however, in the light of Favier's thesis, I find that sometimes the ulcers in Martha F.'s case were described as "sloughy." Thus, with regard to the first ulcer of all, which occurred in 1887, over the right internal malleolus, the following is an actual transcription of my note taken at the time:—"The ulcer is the size of a florin, and on one portion of it there is a sloughy portion of skin."

That there is an intimate relationship between scleroderma and the development of hemiatrophy, both of the face and body, the present case sufficiently demonstrates. In the course of my search (admittedly incomplete) through the literature of the subject, I have been able to find only one or two references to a markedly unilateral distribution of either the one or the other disease. Thus Maritoux (*Thesis*, Paris, 1885, No. 188, p. 24) quotes Emminghaus and Lépine as having reported cases of unilateral scleroderma. Again, in reference to Raynaud's gangrene, Barlow (*loc. cit.*, p. 193) remarks that there have been some cases in which "the attacks were bilateral, and others entirely *unilateral*." That the atrophy in our case is not confined to the skin and soft tissues is evident from the distinct diminution in bulk of the right side of the inferior maxillary and frontal bones; and, on again examining the patient to-day, I must say that I think there is also comparative diminution in the size of the right side of the vault of the skull. The association of facial

hemiatrophy with changes in the skin has been frequently noted in some fifty or sixty reported cases (Mill, *Pepper's System of Medicine*, vol. v, p. 693). The most striking feature, then, of our case is perhaps the involvement in the atrophic process of the whole right side of the body, and not merely, as perhaps more usually occurs, of the face alone.

As to the essential nature of the disease we have been considering, I can offer no definite opinion. So far as I have read, two views seem to be held as to the essential pathology of scleroderma: one that it is an affection of the skin brought about by a perversion of innervation central or peripheral—a trophoncurosis; the other that it is caused by a chronic inflammation of the skin and subcutaneous tissues. The latter view has been ably maintained by Lagrange (*Thesis*, Paris, 1874), who gives, among other cases associated with osseous atrophy, one which came to a *post-mortem* examination, the parts from which he subjected to a detailed investigation. Any neurotic element he regarded as secondary, and probably due to compression of peripheral nerve filaments by inflammatory products. I must say, however, that all the phenomena in our case lead me rather to accept the neurotic hypothesis. The very marked though not absolutely unilateral distribution of the skin affection in the first instance, and the limitation of pronounced atrophy in the later stages to the right side, seem to me to point to the nervous system as the primary seat of derangement. And we must remember that the occurrence of inflammatory processes, acute or chronic, is not incompatible with a primary disturbance of nervous mechanism. Further, the "blae" coloured œdematous swelling of the right hand observed at the very beginning of Martha F.'s case, and the attacks of erythema occurring in the case reported by me in 1881, are perhaps better explained by the neurotic hypothesis than any other.

[An account of the further progress and of the *post-mortem* examination of this interesting case has been added to this volume in the form of an appendix, as the patient died while these pages were passing through the press.]

LECTURE XI.

CASE OF CEREBRAL TUMOUR—GLIO-MYXOMA CEREBRI.[1]

THE case of cerebral tumour, specimens from which I desire to demonstrate at our clinical lecture this morning, is of interest from several points of view. The multiple nature of the tumour is a point of the greatest importance in reference to treatment. You will see in the specimen that we have one large growth occupying an extensive area of the left hemisphere, and a smaller nodule in the right. Although it is obvious that anything in the nature of a radical surgical operation for removal of the growth was out of the question, treatment by the trephine might have been of great service for the relief of pain by lowering intra-cranial pressure. Before, however, further referring to the specimen, the following notes of clinical history, carefully compiled by Dr. T. K. Monro, who at first had charge of of the case during my absence on holiday, may be submitted for your consideration:—

Mrs. A., 23, housewife, was sent into Ward 8 on the 18th August, 1897, by Dr. Burges, who had seen her on the night of the 14th, on account of severe bilious vomiting, with some loss of power in the hands and inability to express herself properly in language. On the 15th and 16th she seemed to be rather better, but at 9 P.M. on the 17th Dr. Burges found her semi-comatose, with some rigidity of the right arm. The left pupil was slightly smaller

[1] Specimens demonstrated to the clinical class, November, 1897.

than the right. Three ounces of urine—apparently the whole secretion since morning—were drawn off by catheter, and were found to contain a considerable quantity of albumen. Patient struggled and cried "gi' me, gi' me," and occasionally screamed aloud. It was noticed that the tongue had been bitten.

Some further information was obtained from relatives at the time of admission. Patient had been vomiting since the 9th inst. She had been subject to headache for many years, but recently this had become much more severe. Her speech was first affected about fourteen days before admission, but became so much worse a week later that her husband could not understand her. Loss of power in the right hand was believed to date from the 14th. Patient became unconscious at 3 P.M. on the 17th.

She had measles and whooping-cough in childhood, and had for some time been subject to bronchitis. She never had scarlet fever, rheumatism, or chorea. She was the mother of two children, the younger of whom (æt. 16 months) she had been nursing until the 14th. There was no history of convulsions before the present illness began, or of œdema in pregnancy, or of deafness, or of discharge from the ears.

The following is from the note made on admission:—Patient is practically unable to express herself intelligibly. Consciousness is in great measure, though not altogether, restored, and patient spontaneously calls attention to the condition of her tongue, which has blood upon it, and has evidently been injured by the teeth. She complains of severe headache in the lower frontal region. She executes some movements she is told to perform, but not all. The tongue, when protruded, deviates strongly to the right side, but there is no conspicuous difference between the two sides of the face. The right arm lies flaccid in the posture of rest. The right leg can be raised from the bed when extended, but patient appears unable to flex the knee. The knee-jerk is well marked on both sides, but there is no ankle-clonus. A trace of each plantar reflex is preserved, but the abdominal and epigastric reflexes are absent on both sides. There is a fairly well-marked *tache*

cérébrale. The pupils are moderately sized or slightly large, and equal. Each contracts directly and consensually to light. There is no loss of power or deviation of head or eyes to the right side.

The heart is not obviously enlarged, and its sounds are normal. Slight wheezing anteriorly is the only noteworthy point in the physical examination of the lungs. The feet are free from œdema.

19th August, 1897.—Patient is fairly sensible this morning. She vomited a good deal yesterday and during the night. She is conscious of the prick of a pin on the upper and lower limbs. Temperature last night, 99°; this morning, 97·4°. The urine contains abundant albumen and large numbers of fatty casts. It is high coloured, and deposits abundant urates. Reaction, acid; specific gravity, 1030. The headache to-day is much less severe. She says that formerly the pain was in the right eye.

The albuminuria rapidly disappeared, and by the 25th August its absence was noted.

7th September.—Patient, though certainly better than on admission, has improved very slowly since the first two or three days of her residence. From time to time she has had frequent attacks of vomiting. She scarcely speaks, though this is perhaps due to lack of will as much as to lack of power. She is extremely emotional, and always low-spirited, so that she weeps with almost no provocation. There is slight weakness of the tongue and face on the right side. The right upper limb is completely powerless, and is all flaccid except the fingers, which are partly flexed. The maximum girth of the right calf is $10\frac{7}{8}$ inches; of the left, $11\frac{1}{8}$ inches. There is no trophic lesion of the skin. Patient does not now complain of headache. Sensation is now found to be defective on the palsied side. When the skin of the arm or leg is struck smartly with a pin point, patient indicates that she is conscious of an impression, yet the pin can actually be pushed through the skin of the fore-arm or leg without any evidence of pain being called forth.

On 10th September, a moderate degree of bilateral optic

neuritis was observed. There were no hæmorrhages, and the macular regions were normal.

From this time onwards, the principal symptoms, in addition to the right hemiplegia and aphasia (which now appeared to include word-deafness) and the optic neuritis, were these—exophthalmos without enlargement of the thyroid; vomiting and screaming at intervals; a considerable degree of blindness though the pupils still contracted to light; increasing weakness of the left upper limb with paresis of the left leg; obstinate constipation; evacuation of most of the urine into the bed; lethargy and obscuration of consciousness; flaccidity of the limbs; exaggeration of the left knee-jerk, the right being normal; or, at another time, the left normal and the right in excess, both plantar reflexes being preserved; absence of abdominal and epigastric reflexes on both sides; retraction of abdominal wall; *tache cérébrale* and subnormal temperature.

The cry alluded to was sudden and loud, and for some days was uttered very frequently. When patient was watched at such times, the appearance of her features was such as to suggest that the scream may have been elicited by an exacerbation of great pain in the head; latterly she became much quieter under the influence of morphia.

On 20th September, at 3·15 P.M., patient had a convulsive seizure, in which there was twitching of the left side of the face and left arm; in the evening, her temperature was 100°. As late as the 23rd September—the day of her death—it was noted that taste and hearing, and reflex contraction and dilatation of the pupils, were preserved, and that there had been no strabismus. At this period the temperature tended to rise in the mornings. About 6 P.M. on the 23rd, her lips became blue, and Cheyne-Stokes respiration set in shortly before death at midnight. The temperature rose from the afternoon up to the end, when it was 106° (in the axilla).

The following is an account of the autopsy, which I conducted myself on the 25th September, 1897, after having obtained, with the greatest difficulty, permission to open the head only:—

Summary of Post-mortem Examination.—Glio-myxoma cerebri, two tumours—large one involving left internal capsule, and smaller the right supra-marginal and ascending parietal convolutions.

The dura mater presents normal appearances, and the longitudinal sinus contains a small quantity of loose *post-mortem* clot. There is no undue adhesion between the dura and the bone. On exposing the convolutions considerable engorgement of the vessels of the soft membranes is discovered. It is also at once apparent that there is great flatness of the convolutions of the left hemisphere, with considerable dryness of their surface. This contrasts strikingly with the moist and non-compressed condition of the convolutions of the anterior portion of the right hemisphere. It is noted that the posterior portion of the right surface is drier than the anterior. The structures at the base of the brain present perfectly healthly appearances, and in particular it is noted that there is no trace of exudation either here or in the convexity. On cutting into the left hemisphere its substance is found to be occupied by a very large gliomatous tumour, consisting of a comparatively loose fibrous-looking network, the interstices of which are filled with a thin gelatinous fluid, which slowly drains away after a little. Anteriorly, the greatest length of this tumour is 4 inches, and vertically, a little less. It occupies practically the whole of the upper portion of the internal capsule; and the greater part of the left corona radiata, the lenticular nucleus, and the outer portion of the optic thalamus are completely destroyed by the tumour. The floor of the left lateral ventricle and the caudate nucleus do not seem to have been encroached upon. The fornix and other structures occupying the middle part of the ganglia on the right side are perfectly healthy. On cutting into the right hemisphere, a smaller tumour of the same nature, and about the size of a walnut, is found immediately beneath the grey matter of the supra-marginal convolution. The anterior margin of this nodule rests upon and involves the substance of the middle portion of the ascending parietal convolution.

Further examination of the body is not allowed.

Dr. Charles Workman, pathologist to the Infirmary, has kindly sent me the following account of his microscopical examination of the tumour:—

"Sections have been prepared by embedding a portion of the very soft pliable part of the tumour together with the firmer brain tissue in its neighbourhood from the region of the corpus striatum in celloidin. These have been stained, some with Ehrlich's acid hæmatoxylin, others by Mallory's method, and they show that the tumour is primarily a glioma, which shades gradually into the normal brain tissue, not being encapsuled nor showing any definite line of demarcation. The cells of Deiter are in great numbers, and beautifully demonstrated in the sections stained by Mallory's method. In the meshwork there are large numbers of round cells with much granular protoplasm, and for the most part with single rounded nuclei. These cells appear to lie almost quite loose in the stroma. The soft pliable part has the appearance of a myxomatous degeneration of the tumour, the connective tissue and cells of Deiter being widely separated, and the spaces being filled with clear fluid in which are seen similar cells to those described in the meshwork of the denser part. These round cells are very various in size, many of them being large like mononuclear leucocytes."

The accompanying micro-photographs, by my former resident, Mr. Archd. Young, M.B., B.Sc., have been prepared from two of Dr. Workman's sections, and afford a very good idea of the histological appearances of the growth.

FIG. 34.—*High power.* Shows well the delicate fibrous meshwork, with the round mononuclear cells lying loose in the stroma. A number of Deiter's cells are also shown. (*Photo. by Archd. Young, M.B., B.Sc.*)

FIG. 35.—*High power.* Shows section of one of the blood-vessels of the tumour, with its perivascular lymphatic sheath infiltrated with leucocytes.

FIG. 34.—High Power. Shows well the delicate fibrous meshwork, with the round mononuclear cells lying loose in the stroma. A number of Dexter's cells are also shown. (Photo. by Arrold, Young, M.A., B.Sc.)

FIG. 35.—High Power. Shows section of one of the blood vessels of the tumour, with its perivascular lymphatic sheath infiltrated with leucocytes.

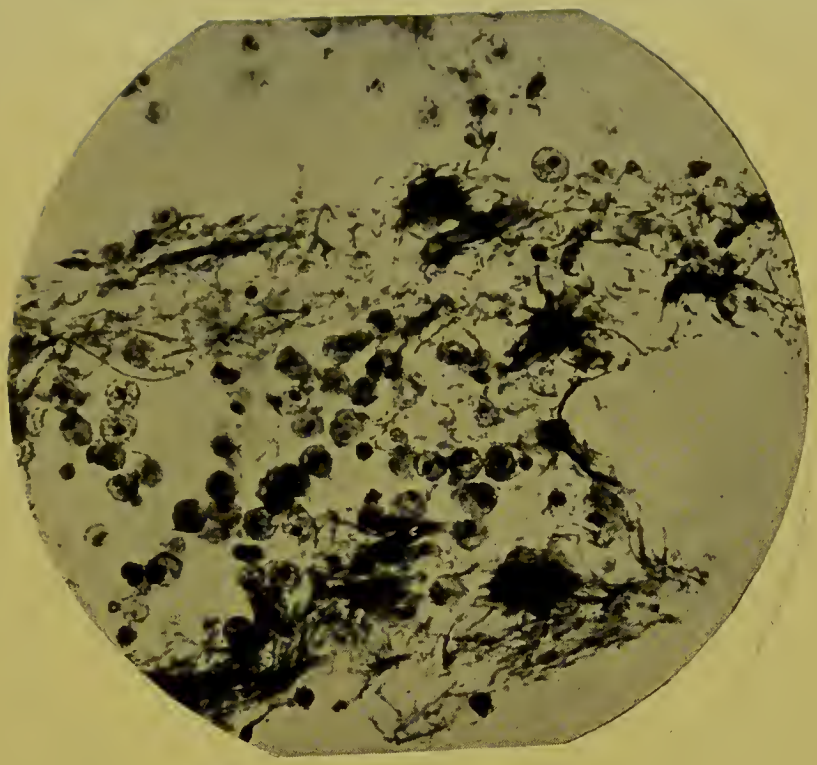


Fig. 34.

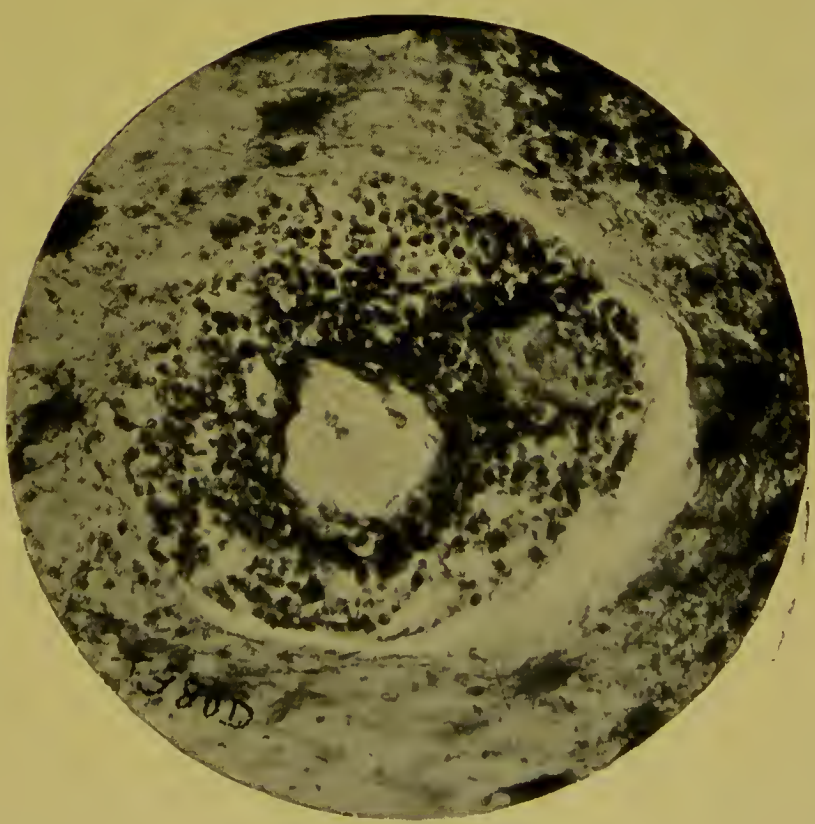


Fig. 35.

LECTURE XII.

SPASTIC PARAPLEGIA IN A BOY, PROBABLY DUE TO A PROGRESSIVE MYOPATHY.[1]

I HAVE ventured to call the affection from which this boy is suffering spastic paraplegia, although I am by no means sure that it fulfils the requirements of the clinical condition ordinarily designated by this term. While the rigid condition of his lower limbs, and his stiff, deliberate, and very peculiar manner of walking are suggestive of a spastic paraplegia, the entire absence of knee-jerks and ankle clonus, and the tendency to deformities of the feet and trunk, rather indicate that the site of the disease may be primarily in the muscles themselves. Of the peculiarities of the case, however, you will be in a better position to judge after I have related the clinical history and shown you the patient.

The lad is a messagc-boy, aged 15 years. Three years ago he first complained of a pain and stiffness in the left knee-joint, which interfered with his walking properly. For the next two years the difficulty of locomotion went on increasing, occasional attacks of pain in the left knee-joint being also experienced. About a year ago he first observed a deformity occurring in the left foot—in fact, the development of a condition of talipes equino-varus. During the three years that his power of walking has been interfered with, he has frequently suffered from headaches; and he attributes his illness in the first instance to cold contracted while going about a great deal with his bare feet.

[1] Delivered January, 1898.

As regards his previous history, the following points are of some importance. At the age of 5 years he suffered from "croup and diphtheria," for which he was treated in the Sick

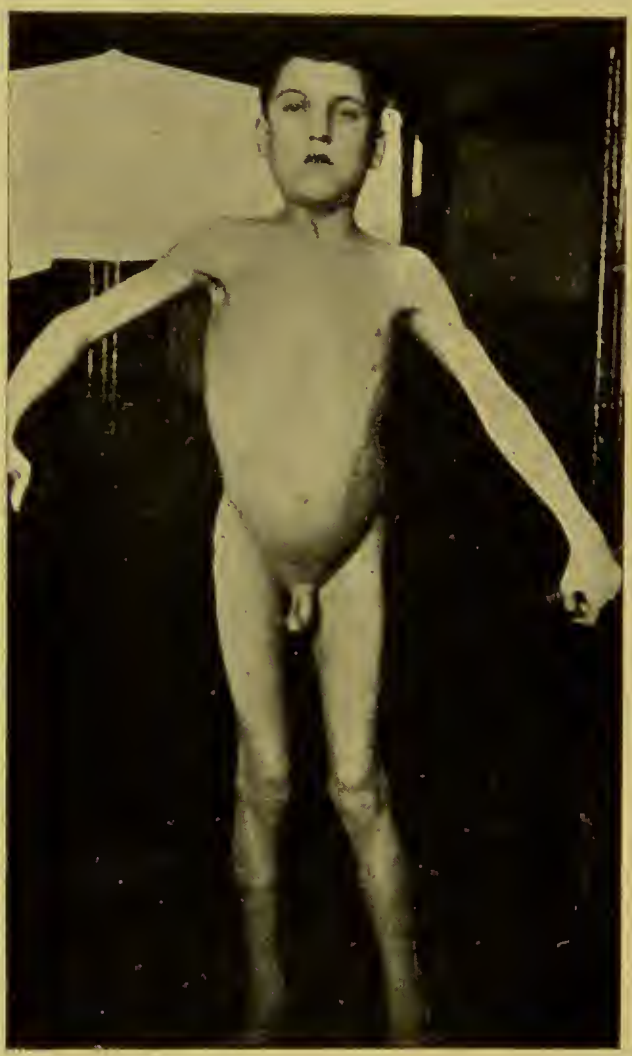


FIG. 36.

Shows attitude of boy on 6th March, 1898, when he attempted to stand with his legs tolerably close together. The position of the arms shown in the photograph gives a good idea of the manner in which they were held during walking, ready to grasp any object capable of giving support. Without support it was practically impossible for him to stand in the position photographed. (*Photo. by Mr. John Garroway.*)

Children's Hospital, where tracheotomy was performed. No paralysis followed this attack. He has also suffered from chicken-pox and other infectious maladies.

The family history throws no light upon the case. His

father is alive and well. His mother has developed a tubercular disease of the knee-joint during the last six months. Three sisters and one brother younger than the patient are in good health. Three of the family died in early infancy.

FIG. 37.

Shows marked lordosis, and the necessity for support in standing (6th March, 1898). (*Photo. by Mr. John Garroway.*)

This is the second time that the lad has been under my care, he having been admitted to Ward 7 for the first time on the 24th July, 1896. During a residence of several months at this time, the following observations as to his condition were put upon record:—His walking was peculiar. In progression he

swung the legs outwards and forwards, as if in addition to the need for carrying the limbs forward there was also a necessity to overcome a spastic tendency to adduction of the thighs. He brought his heels to the ground first, but not with any undue force. Both in standing and walking he required to dispose his feet in such a way as to secure a broad base. No patellar reflex or ankle clonus could be made out; the superficial reflexes were normal. There was marked stiffness of the lower extremities upon any attempt at passive motion; but he never experienced spontaneous spasmodic contractures of the lower limbs. No actual paralysis of the leg or thigh muscles, which were of good volume and consistence, could be made out. He was able to stand steadily with his feet close together, but when he did this his attitude was awkward, owing to his knees overlapping. If he attempted to stoop without bending his knees he fell forward upon his face. His general nutrition and development were good. He was and is very intelligent, and reads well. There was no facial paralysis or difficulty of speech. The senses of pain, touch, and temperature were quite normal. The organs of the chest and abdomen were healthy. The functions of the bladder and rectum have all along been normal.

In the month of September, 1896, it was noted that the rigidity and hardness of the muscles of the lower limbs were more marked than before, and when he stood with his eyes closed he was noticed to sway slightly. There was no nystagmus, no squint, no diplopia. In walking he now held his arms out from the body, partly to balance himself, partly to be ready to clutch any object suitable for support. The manner of holding the arms suggested an attitude seen in some cases of disseminated sclerosis. It was also observed that there seemed to be a very slight degree of inco-ordination of the upper limbs, although this did not interfere with his writing very well. Very definite high arching of the instep was at this time noted, so that sometimes he seemed to be walking only on the heel and the toes.

In October, 1896, while at the Convalescent Home, he suffered from an attack of pain and swelling in the left

knee-joint, which, however, soon passed off, leaving the other phenomena as recorded.

The boy was readmitted on the 28th October, 1897. His difficulty of walking was very greatly increased. In moving about it was necessary for him to lay hold of any object within reach capable of supporting him as he laboriously dragged his limbs along. By a swinging motion of the body he dragged the legs forward, carrying them well out from the trunk, so that he occasionally had the appearance of attempting to take a very long step. The toes reached the ground first, and he often landed on their dorsal aspect so that they became doubled up under the foot. The left leg, as has been the case all along, was still the worst. The muscles of the legs showed no atrophy, and were firm and rigid. The foot could not be passively flexed upon the leg beyond a right angle. No ankle clonus and no patellar tendon reflex could be elicited. These features of the case are still well seen when I ask the boy to walk across the room; in addition, certain deformities have become developed. There is a marked condition of talipes equino-varus of the left foot. Lordosis is now very pronounced, as well as a degree of lateral curvature of the spine, the convexity being towards the right (Figs. 36 and 37, pp. 146 and 147). Dr. T. K. Monro has made a very careful investigation of the state of the cranial nerves, of which his summary is as follows:—"There is slight nystagmus, only noticed on extreme deviation of the eyes. The right pupil is very slightly larger than the left, otherwise everything is normal."[1]

[1] Detailed note of the condition of the cranial nerves by Dr. T. K. Monro:—

9th to 11th November, 1897.—I. Smell preserved.

II. O.E. (both eyes alike).—Discs not very well defined but quite healthy. Some fibre bundles extend along some of the vessels from the discs. Remaining parts of fundi normal. V.A. = $\frac{15}{15}$ in each eye.

III, IV, and VI. There is no external ocular palsy, and patient never has diplopia. There are slight horizontal nystagmoid movements of the eyeballs when these are rotated far from the mid-position; but spontaneous nystagmus is not observed.

Pupils.—The left pupil is medium-sized, the right very slightly larger.

There is no atrophy of the muscles of the arms, and the slight inco-ordination previously noted has not become worse. No fibrillary tremors have at any time been observed.

The case is in many respects peculiar, and I have had considerable difficulty in arriving at an opinion as to its true nature. Three conditions presented themselves to me for consideration :—

1. Infantile spastic paraplegia due to degenerative lesions or defective development of the lateral columns of the spinal cord. The entire absence of the knee-jerks and of ankle clonus, as well as of any tendency to spasm of the legs, soon led me to set this consideration aside.

2. Friedreich's hereditary ataxy was next taken into account. The age of the patient and the absence of the deep reflexes were, on the whole, in favour of this view as to the

Each contracts directly and consensually to light, and contracts when the visual axes converge in attempts at accommodation. Accommodation itself is good. Each pupil appears to dilate on stimulation of the skin of the neck ; but a little doubt is introduced by the free spontaneous movements or unrest of the pupil.

Motor.—The masticatory muscles are strong—the masseter, temporal, external and internal pterygoids being all ascertained to act on both sides.

Sensory.—There is no pain, and no defect of sensation (finger-touch, contact of pin-point, heat, and cold) in the face.

Taste is preserved in (i) palate and fauces, (ii) posterior part of tongue, and (iii) anterior part of tongue.

VII. Facial muscles are normal.

VIII. Hearing, so far as can be tested in a noisy ward, is well preserved. Rinne's experiment positive on each side.

IX, X, and XI (medullary portion). There is no evidence of disturbance of the functions of these nerves. Respiration (taken every three hours for the past two days) has varied from 16 to 24, and the pulse from 74 to 100. The temperature during the same time has been 97·6° to 99·2°. The soft palate is actively moved. There is no coughing, choking, or difficulty in deglutition.

XI (spinal portion). Sterno-mastoids and trapezii strong.

XII. Tongue normal.

Summary.—Slight nystagmus, only on extreme deviation of the eyes. Right pupil very slightly larger than left. Otherwise everything normal.

nature of the complaint. It soon became so evident that the difficulty of locomotion was due to a muscular disability rather than to a disorder of co-ordination that this diagnosis was also departed from.

3. A progressive muscular dystrophy or myopathy seems to me to be the only diagnosis left. In children there are chiefly two varieties of this disorder met with—viz., pseudo-hypertrophic paralysis and simple idiopathic muscular atrophy; the latter form, however, according to Gowers, rarely begins in early childhood. Of neither of these forms can the present case be regarded as a perfectly typical example. Of pseudo-hypertrophie paralysis I have now seen several examples of a characteristic kind, and certainly this boy has never struck me as being at all like them. The absence of a family tendency so far as we can ascertain, the commencement of the disease in the left lower limb, in which the disability has all along been most marked, and the mode of walking, all seem to me to place the case in a category different from that of ordinary Duchenne's paralysis. That it is not an ordinary case of simple idiopathic muscular atrophy, either of the "juvenile" or "facio-scapulo-humeral type," the definite absence of any distinct wasting of the museles seems to indicate. The marked museular disability, the absence of the deep reflexes, the acquired talipes equinus, and the gradual developmcnt of lordosis and lateral curvature of the spine, with the unimpaired sensory and intellectual faculties, all seem to indicate the propriety of classing the case as an undefined member of the general group of muscular dystrophies.

Last session I demonstrated to you a series of cases of museular atrophy. With Case 3 of this group (see Lecture IX, p. 121 *et seq.*) the present one might with profit be eomparcd, although in many respects they scem to be materially different in elinieal details.

In the case which has been made thc subject of this clinical lecture there was no marked atrophy. The muscles of the legs were firm and of good size, a condition which may be seen in the photographs reproduced at pp. 146 and 147.

There was also no atrophy or paralysis of the muscles of the upper extremities. In Case 3 of Lecture IX there was a clear history of a crushing injury, and we came to the conclusion that, on the whole, it conformed to the features of Erb's "juvenile type" of muscular dystrophy. In these details the two cases certainly differ from one another; but, notwithstanding, I cannot get rid of the idea that the fundamental lesion may very likely be the same in both.

The lad has been treated by tonics, massage, and electricity, without very obvious change in his condition, and I do not anticipate that any great improvement can be hoped for. We did not try the effect of hypodermic injections of strychnia.

LECTURE XIII.

THE TREATMENT OF EFFUSIONS OF FLUID INTO THE PLEURAL CAVITY BY THE OPERATION OF PARACENTESIS THORACIS.[1]

As an introduction to our present course of clinical medicine I mean to address you to-day upon the subject of the removal of fluid accumulation from the pleural cavity by the operation of paracentesis thoracis. This mode of relieving empyema was known to Hippocrates, but manifestly it could only have been employed when pointing had occurred. Before the time of Laennec it is obvious that the performance of the operation under any other circumstances was almost, if not quite, impossible. Once, however, we were able by physicial examination to ascertain the presence of fluid in the pleural cavity, even in small quantity and under circumstances in which the occurrence of pointing could probably never take place, the possibility of its mechanical removal by puncture was bound to occupy the attention of practical physicians. In the earlier part of this century the operation came to be a recognised procedure in the treatment of pleural effusion, although at first it was viewed with much disfavour. To the labours of Bowditch in America, of Trousseau and Dieulafoy in France, and of Gairdner, Begbie, and Clifford Allbutt in Great Britain, we are indebted for the assured position which the operation of paracentesis thoracis now occupies as a justifiable and safe therapeutic procedure.

[1] Delivered 29th October, 1897. Reprinted by the kind permission of Messrs. J. B. Lippincott Company, Philadelphia, from *International Clinics*, vol. iv, seventh series, 1898.

The other day some of you saw me examine an elderly man suffering from an extensive pleural effusion, apparently the result of an acute attack of pleurisy which had occurred some six months before. Next morning I removed 60 oz. of clear straw-coloured serous fluid from the right side of this patient's chest. As the basis of the remarks which I am about to offer you upon the operation I shall take this case and the others upon which we have operated during the past two sessions.

During that time there have been treated in my wards thirty-nine cases of pleurisy, either primary or secondary, with evidence of fluid effusion. Of these, twelve required operation for the removal of fluid, serous or purulent, and to the list of hospital cases I add two private ones, making the total operated upon during these two sessions fourteen. Of the cases operated upon, nine were cases of pleurisy with serous effusion; two were cases of malignant disease within the chest, giving rise to secondary pleuritic effusion; three were cases of empyema transferred to my surgical colleague and operated upon by him. Among the cases not operated upon were a number in which the presence of fluid in the pleural cavity was verified by hypodermic puncture. I shall now read to you brief summaries of the cases upon which I have operated, before making any general remarks upon the operative procedure itself.

I. Cases of Pleurisy with Serous Effusion.

Case I.—David W., aged 17, a plumber, was admitted to Ward 7 on the 9th November, 1895. Indefinite history of cough and pains in the chest before the 2nd November, on which date rigors and pain in the right side set in, followed by attacks of paroxysmal coughing ending in dyspnœic seizures. Fever moderate, running about 100° F. Signs of considerable right pleural effusion, but respiratory murmur nowhere abolished. On 10th November 36 oz. of clear serum were removed by paracentesis, with marked relief to the breathing. Pulse, temperature, and respiration normal from the 17th onward. Slight retraction of right side of the chest

first noticed on 31st December, 1895. Dismissed 17th January, 1896, with well-marked retraction of right side of the chest, but, as regards his general health, well.

CASE II.—Robert D., aged 15, an apprentice mason, was admitted to Ward 7 on the 11th July, 1896, with pleural effusion of large extent on left side. Dulness behind and below fifth spine, and over the whole left front, but respiratory murmur, though enfeebled, nowhere abolished. Marked displacement of heart to the right side. High fever, ranging between 102° and 104° F.; much dyspnœa.

14th July.—Paracentesis in seventh left interspace in line of lower angle of scapula to 70 oz. of clear serum.

24th July.—A second paracentesis of left side to 15 oz. of clear serum.

1st August.—Evidence of effusion in the right pleura; fever still high; dyspnœa still urgent; general state very grave. Paracentesis of right pleural cavity in sixth interspace in axillary line in recumbent posture; 38 oz. of clear serous fluid removed. Great relief to breathing after third paracentesis.

8th August.—Evidence of pneumonia at both bases, with cough and moderate expectoration containing diplococci.

Slow convalesence; dismissed, greatly improved, 18th September. Reported himself 7th October, 1896, and again 25th February, 1897, in fair general health, but with some dulness and retraction of both bases below level of eighth dorsal spine.

CASE III.—William M., aged 27, a dock labourer, was admitted 15th August, 1896, with well-marked signs of right pleural effusion setting in acutely with pain on 1st August. In front dulness below level of second rib, and posteriorly below level of fourth dorsal spine. Respiratory murmur abolished at right base behind. Fever ranging from 101° to 104° F.; pulse, 90 to 100; respirations, 30.

19th August.—Paracentesis to 48 oz. of clear serum. From 22nd August gradual decline of fever, thought not quite to normal; pulse running about 80; respirations from 20 to 24.

4th September.—Dismissed, at his own request, very much improved.

CASE IV.—Patrick C., aged 24, a mason's labourer, was admitted to Ward 7 on 23rd November, 1896. Tolerably abundant pleural effusion of left side setting in acutely with pain and accelerated respiration three weeks before admission. Also cough and spit for some time previous to this. Slight displacement of heart to right. Skodaic note in left infra-clavicular region.

27th November.—Dry tapping, the cannula probably getting blocked by fibrin.

3rd December.—Owing to dulness in front extending and skodaic note disappearing, paracentesis again attempted, and 45 oz. of clear serum removed, with return of resonance in front.

22nd December.—Since 7th inst., evidence of reaccumulation of fluid in left pleural cavity, and so to-day a second tapping, with removal of 35 oz. of clear serum.

6th January, 1897.—Moderate hectic fever, with evidence of slight tubercular disease at right apex.

Marked retraction of left side.

Dismissed 12th Februray, and seen again 8th March, with evidence still at right apex of phthisis pulmonalis.

CASE V.—Archibald K., aged 19, was admitted 22nd January, 1897. Acute left pleurisy with effusion setting in with a rigor on the 14th inst. On the 25th January, owing to a rapid increase in the effusion and the disappearance of skodaic note, paracentesis to 56 oz. clear, slightly brownish serum. Speedy convalescence and rapid disappearance of all the signs. Dismissed well 12th March, 1897, the temperature, pulse, and respirations having been strictly normal since the 1st February.

CASE VI.—James E., aged 8, a schoolboy, was admitted to Ward 8 on the 17th February, 1896, with evidence of considerable effusion into right pleura. A week before

admission, sudden onset of high fever, with great aggravation of a pain in the right side, of which he had been complaining for a week or two previously. Physical signs characteristic. On 21st February, paracentesis to 16½ oz. of clear serum, after which steady but somewhat prolonged convalescence, with disappearance of all the signs. Dismissed well 24th April.

Case VII.—Miss A. B., aged 26, was seen in consultation with Dr. William Little, of Dumbarton, 8th April, 1896. Family history distinctly tubercular. In the sputa of one of her sisters I have twice found tubercle bacilli. Patient's health for a year had not been satisfactory. Five weeks before consultation pain in left shoulder, followed by progressive dyspnœa, forcing her to take to bed upon the day I saw her with Dr. Little. Signs of marked left pleural effusion with displacement of heart to right, Advised paracentesis. Not consented to at first, but a week afterwards Dr. Little withdrew 60 oz. of clear serum. I saw her a month later doing well, and since then she has been keeping in fair health.

Case VIII.—Mrs. M'L., aged 35, a housewife, was admitted to Ward 8 on the 20th July, 1897, suffering from anæmia, debility, fever, and sweating, following upon a confinement of twins two months before admission, without a history of special difficulty or hæmorrhage at the time of delivery. At the time of admission, signs of moderate effusion into left pleural cavity, preceded for a day or two by pain in the left side. The temperature was suggestive of septicæmia, and it was thought that the effusion into the left pleura might be purulent. On 29th July, owing to signs of great increase in the amount of pleural effusion, paracentesis was performed, and 70 oz. of clear serum were removed, with no trace of pus. This patient had other symptoms apart from the pleurisy which were regarded as originating in septic absorption; but she made a very good recovery as regards the pleural condition, and she was dismissed in fair health upon the 24th September, 1897.

Case IX.—James M'C., aged 60, a weaver, was admitted to Ward 7 on the 4th October, 1897, suffering from right pleural effusion of considerable amount, with a sense of weakness or oppression in the right side and very urgent dyspnœa on any exertion. He suffered about five months before admission from an attack of acute pleurisy, which had followed upon an attack of influenza some weeks before. There was dulness over the whole lower half of the right back and to the level of the third cartilage in front, but the respiratory murmur was not abolished. On 7th October, paracentesis of right side and 60 oz. of perfectly clear serum removed, with great relief to the breathing. A number of you saw me operate upon this case, and to-day you observe that he is progressing very favourably in all respects.

II. Cases of Malignant Disease within the Chest Associated with Pleural Effusion.

Under this heading I have had, in the time covered by the cases reported in this lecture, two illustrations. One was a man, aged 44, upon whose right pleura I operated twice, removing on the first occasion 35 oz. of clear serum, and on the second 65 oz. of purulent serum. The operation afforded marked temporary relief and prolonged his life.

The second was that of a lady, aged 35, whom I saw on two occasions with Dr. James Craig, of Dennistoun. On the first occasion I removed 60 oz., and on the second, two months later, I withdrew 45 oz. of deeply blood-stained serous fluid. I have no doubt that the operations greatly prolonged this patient's life; and the hæmorrhagic nature of the fluid, as well as a number of enlarged glands, confirmed our diagnosis of intrathoracic malignant disease.

III. Cases of Empyema.

I need not detail the clinical features of the three cases of empyema included in the list given in this lecture, as when the fluid was found to be pus I at once stopped evacuating

it, and transferred the patients to the surgical wards, where they were operated upon. Two of the three made good recoveries from the operation: the third, a baby aged 14 months, died.

These cases which I have thus very briefly epitomised from our ward journals, in which you will find full details, along with a number of others in which I had previously been concerned, either as principal or assistant, form a certain basis of experience upon which I may now proceed to offer to you a few remarks on the operation itself.

Method of Operating.

I usually employ the medium-sized trocar and cannula supplied with Potain's aspirator, but seldom the aspirator itself, as I generally get quite sufficient fluid to drain away without using suction. To the outlet of the cannula I fix a long indiarubber tube, which bears the fluid to a vessel at the bedside. I prefer the patient to be in the sitting posture, leaning slightly forward, and, if convenient, with his elbows resting on a table. The night before the operation, my nurses thoroughly cleanse the skin of the chest and apply an antiseptic dressing. The instrument and tubes are boiled and kept in a 1 in 40 carbolic lotion till they are to be used. I prefer to operate in the line of the lower angle of the scapula in the seventh, eighth, or ninth interspace. I use no anæsthetic, either general or local, but I warn the patient that I am going to cause him momentary stabbing pain, and tell him immediately before I am going to puncture. With the point of my left forefinger I mark the spot selected, pressing it firmly into the interspace, and only raising it when I am ready to plunge in the trocar, which should, if possible, be driven into the pleura with one thrust. I hold the instrument with its head resting against the middle of my palm, and my forefinger at an inch from the point. The difficulty is to anticipate the involuntary jerk which the patient gives to his chest as he feels the point penetrating the skin. If one does not succeed in this, he either hits

a rib or has the point of his instrument eaught between two closely applied ribs. If this happens, it is, I think, better not to withdraw the instrument, but rather by a slight to-and-fro movement of the point to get it home by a seeond thrust. If a flow does not eome at onee, the blunt-pointed probe may be pushed through the eannula, when fluid usually eomes. After the cannula is *in situ* I have never found patients object or complain of pain. By a eannula of the size I have indieated, about half an hour is necessary to withdraw 50 or 60 oz. of fluid. I never attempt to remove the whole of the fluid, and I withdraw the eannula upon the following indieations manifesting themselves:—(1) Persistent stoppage of the flow; (2) persistent uneontrollable coughing; (3) supervention of aeute dragging pain; (4) feelings of faintness or dyspnœa. If it is dangerous for the patient to be moved, or to sit up, I operate in the reeumbent posture. I think there is practieally no danger of air entering the pleura in this method of operating; at least, it has not so far happened to me, and if it did, I do not think that a large quantity eould get in or that it would do mueh harm.

Cases Suitable for Paracentesis Thoracis.

I prefaee what I have to say on this point by the remark that all eases are suitable in which the meehanieal effeet of the fluid present is sueh as immediately to endanger life by suffocation. If, however, we elassify our cases, aeeording to a pathologieal basis, into suitable and unsuitable, I would say that *suitable* cases are (1) pleurisy with effusion, aeute or chronic; (2) cases of pleural effusion, due to malignant disease in the lung or mediastinum, the operation being a palliative measure merely. *Unsuitable* cases are (1) empyema —if pus is obtained, the operation should at onee be diseontinued and the ease passed on to the surgeon, for, as Clifford Allbutt has pointed out, the removal of pus through the needle is likely to be followed by symptoms of septic absorption; (2) effusion due to renal disease; (3) effusion due to eardiae disease. This elassification, however, is entirely

subject to my prefatory remark at the beginning of this paragraph. Attempts to estimate from the physical signs the actual quantity of fluid present are not, in my opinion, very satisfactory, nor are such estimations of great clinical importance.

Indications for Paracentesis Thoracis.

The chief indications are dyspnœa and physical signs pointing to a large and rapidly increasing effusion. The presence of fever is no contra-indication. With Dieulafoy, we may agree that cases raising the question of paracentesis may be grouped into two classes—(1) *urgent* cases, and (2) *debatable* cases. With the former we must proceed to operate at once; with the latter we may delay and perhaps try other means first. The indications of urgency may be briefly stated as these:—(1) Displacement downward of the diaphragm; (2) the presence of fine moist râles in the opposite lung; (3) the supervention of cardiac murmurs from displacement of the heart; and (4) above all, the existence of urgent dyspnœa. Debatable cases are those in which none of the signs of urgency are present. In these we may delay operation in order to permit of a trial of other methods; but it must never be forgotten that too long delay may result in the formation of adhesions which will prevent the expansion of the lung. On the whole, I think the removal of fluid by paracentesis is preferable to its more slow dispersion by blisters and other local applications.

It is also to be remembered that there are many cases in which nature, assisted by medical art, may rapidly remove even a large effusion without resort to puncture, but experience alone enables us to recognise such cases and so to deal with them appropriately.

Results and Dangers of the Operation.

As regards the results and dangers of the operation, in cases of pleurisy with a serous effusion, I must say that my

experience has been very favourable. Removal of the fluid in this way, in my opinion, hastens the recovery. It does not, however, always prevent a decided retraction of the affected side of the chest from taking place, especially when the fluid has been effused for several weeks before the operation is performed. I much prefer this method of treatment to that by blistering. In only one of my cases have I had experience of a profuse serous expectoration following the operation. This occurred in one case, and lasted for twenty-four hours, but did not apparently do the patient any harm. I do not think that a puncture of the lung with a trocar and cannula of the size I use would be followed by much injury to the patient. It was once my experience, when using Potain's aspirator, perhaps, though not certainly, from puncture of the lung, to produce an extensive subcutaneous emphysema, developing while the needle was *in situ*. I was greatly distressed, but the emphysematous condition slowly disappeared, leaving the patient nothing the worse; and the fluid in his pleura, which had been proved by exploratory puncture beforehand, also slowly disappeared. The experience, however, was decidedly unpleasant.

In cardiac and renal hydrothorax I would prefer not to operate unless there were some very special indication, such as dyspnœa, because in such cases re-accumulation is almost certain to follow, and the cases are, on the whole, best dealt with by medical means.

One warning in conclusion. Never, in acute extensive pleuritic effusion, with great dyspnœa on any exertion, hesitate to perform paracentesis immediately. Once in the earlier days of my practice I was called by a medical friend to see such a case. We discussed the operation, and determined to delay it till the following morning, and the patient died suddenly in the night. This case I never forgot. I do not say that we would have saved the patient's life, but we would at least have given him a chance. The physical signs were those of the largest pleural effusion I have ever seen; as he lay in bed there was no apparent dyspnœa; we forgot, however, that a sudden movement or a fit of coughing

might prove fatal; and so, indeed, it happened. Remember, however, that in such a case the risk of syncope during the operation is considerable, and to be forewarned is to be forearmed on this point.

[Since the foregoing lecture was delivered in October, 1897, till the time of going to press (June, 1898), I have performed the operation of paracentesis thoracis at least six times, removing on each of these occasions considerable quantities of fluid with very satisfactory results. This additional experience does not lead me to modify in any important detail the views expressed in the lecture. In several of these cases I made use of the aspirator, which allows, perhaps, of a more rapid evacuation of the fluid, although this is in some cases a doubtful advantage. I have also, in one or two cases, instead of the fine trocar and cannula, employed the hollow needle, which, having no shoulder, is more easily introduced. The hollow needle, however, has two disadvantages—(1) It is more apt, from its sharp point, to injure the lung; and (2) it cannot, in the case of its being obstructed by fibrinous material, be cleared by the introduction of a blunt probe.]

LECTURE XIV.

CASE OF SPLENIC LEUKÆMIA, WITH OBSERVATIONS UPON THE CHARACTER OF THE BLOOD IN THIS DISEASE.[1]

LEUCOCYTHÆMIA (Hughes Bennett) or leukæmia (Virchow) is a disease of sufficiently rare occurrence to merit a careful study and description of each case as it arises. The essential features of the affection have been well known to the profession since 1845, when they were almost simultaneously, but quite independently, described by Hughes Bennett of Edinburgh, and Virchow. The outstanding phenomenon of the disease is an enormous increase of the white blood corpuscles, so that in severe cases they may be practically equal in number to the red discs. Recent researches on the lines inaugurated by Ehrlich have led to a much more perfect knowledge of the minute changes occurring in the blood, and have enabled pathologists to recognise well differentiated varieties of leukæmia. In all varieties of true leukæmia the increase in the number of the white blood corpuscles is an essential factor, and hence in our present study any reference to so-called pseudo-leukæmia may be omitted. Two varieties of leukæmia are so sharply demarcated by the microscopical characters of the blood that they may practically be regarded as separate and independent affections. They are:—

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[1] Delivered 11th March, 1898. Reprinted by the kind permission of Messrs. J. B. Lippincott Company, of Philadelphia, from *International Clinics*, 1898.

1. Splenic leukæmia, which has also received the following designations: Spleno-myelogenous leukæmia, lieno-myelogenous leukæmia, myelæmia, leukæmia lienalis, and spleno-medullary leukæmia (Muir).

2. Lymphatic leukæmia, to which the name lymphæmia has also been applied.

These varieties constitute two well-marked types of the disease, but Rieder, in his atlas of the blood, has described and illustrated an intermediate form, to which he has given the name of "gemischte leukæmia." Further discussion of the differential characters of these varieties of leukæmia may be left over until I have described the symptoms of the patient in Ward 7 who is suffering from the spleno-medullary form, and referred more briefly to other cases of the disease which have from time to time come under my observation.

Thorvald T., aged 18, a Norwegian sailor, was admitted to the hospital on the 17th January, 1898, complaining of diarrhœa of six weeks' duration, and of swelling of the feet and ankles since the preceding day. The captain of his ship believed that he was suffering from beri-beri, and sent him to the infirmary with an intimation to that effect.

Inquiry elicited the following information as to his previous history. As a child he had suffered from no illness except thread worms. Two years before his admission, on leaving Mobile, a seaport of Alabama, on the Gulf of Mexico, he developed on board ship a sharp attack of malarial fever, which lasted for a month, confining him entirely to his bunk for a period of ten days. Six months after this he had another attack which lasted only a few days. A year later, while in the West Indies, he passed through an attack of yellow fever, and shortly before this, while his ship was at one of the ports of Brazil, he spent ten days in hospital on account of a rheumatic affection of the left hip. A careful inquiry as to the ordinary symptoms of beri-beri yielded no evidence of his ever having suffered from that disease.

With the exceptions just mentioned he remained well and able for his work until six weeks ago, when, on his way home

from Jamaica, he began to suffer from diarrhœa. In spite of this, and of the circumstance that he was losing flesh, he remained at his work until Sunday, the 16th January, when he had become very weak and his feet had commenced to swell. On this account he was sent to hospital on the 17th.

His family history is unimportant. His parents died when he was very young. He has one brother alive and well. Two sisters died in infancy, and a brother at the age of 8 years.

In proceeding to demonstrate to you the clinical phenomena of this patient's case I may confine myself to the salient features of his disease, referring you for information as to the state of his organs in general to the detailed report in the Ward Journal. As you see, he is a well-built and fairly well-nourished young man. His complexion is sallow, on the whole rather suggestive of malarial cachexia, but certainly not at all indicative of pronounced anæmia. The tongue is clean; the pulse is full, soft, regular in force and rhythm, numbering about 80 per minute. There is no paralysis; sensation is everywhere perfect; the knee-jerks are normal; there is no ankle clonus; and œdema has entirely disappeared. Without going into the details of physical examination it may be stated generally that his heart and lungs present healthy characters; his urine contains neither sugar nor albumen; his temperature is practically normal; his appetite has been fairly good; and his diarrhœa is now practically well.

On inspection as he lies in bed, you observe a distinct uniform and practically symmetrical enlargement of the abdomen. Palpation at once reveals a large solid mass filling the left side of the abdominal cavity, which extends from the left axillary region to the hypogastric region, and which we have no difficulty in at once recognising as a greatly enlarged spleen. Its surface is smooth, and in the epigastric region the splenic notch can be easily felt. The percussion over the enlarged organ is dull, and the greatest oblique diameter, from where the line of dulness cuts the sixth rib in the mid-axillary line to the lowest point in the hypogastric region at which its lower end can be felt, is 16 inches. In the anterior axillary line the greatest vertical diameter is

12 inches. The organ has been increasing in size during the two months he has been under observation. The hepatic area is not enlarged, nor is the cardiac, though the latter is now perhaps slightly higher than normal, the heart having been pushed up a little by the greatly enlarged spleen. The lymphatic glands in the axilla are unduly palpable; and those of the groin are distinctly, though slightly, enlarged.

The possibility of the enlarged spleen being a malarial manifestation is at once removed by an examination of the blood, specimens of which I have placed under the microscopes for your inspection. You will at once perceive the enormous numbers of white blood corpuscles, which are present in the proportion of one white to six red corpuscles. The red corpuscles number two millions to the cubic millimetre of blood—a decided anæmia; and the hæmoglobin is equal to 35 per cent. No melanin granules have ever been seen.

To my clinical assistant, Dr. T. K. Monro, I am indebted for the following report of his ophthalmoscopic examination:—"*Right eye.*—Both arteries and veins very tortuous; calibre of arteries not distinctly altered; fundus otherwise normal. *Left eye.*—Arteries somewhat tortuous; veins broad and tortuous; small flame-shaped hæmorrhage below the disc; otherwise fundus normal.

The history which I have read to you, and the clinical facts which I have demonstrated, leave no doubt that we are here dealing with a typically characteristic case of splenic leukæmia. Before passing on to describe very briefly the other cases of which I have notes, and to speak more in detail of the condition of the blood, I may state that during residence, notwithstanding the increase in the size of the spleen, the general condition of the patient has improved. While at the convalescent home a week or two ago he contracted a bronchial catarrh, and was slightly feverish for a day or two, but this has now passed off. His blood has not altered in any appreciable way, although a recent count showed white blood corpuscles now to be in the proportion of 1 to 9; and he is now on treatment by 5 minim doses

of Fowler's solution, and inunction over the spleen of red oxide of mercury ointment.

Including the case I have just demonstrated to you, I have personally seen and examined five cases of leukæmia—three in the wards as a clinical physician, and two in the deadhouse as a pathologist. Four of the five cases were of the splenomyelogenous and one of the lymphatic type of the disease. Of the three clinical cases I need say nothing more than that all of them more or less closely resembled the case you have seen this morning both as regards the characters of the spleen and the blood. With regard to the *post-mortem* cases I may enter a little more into detail.

One of them was very characteristically of the splenomyelogenous type. The patient, a man aged 26, died in the wards of my colleague, Dr. Alexander Robertson, and I made the *post-mortem* examination upon the 29th June, 1890. At my request, Dr. T. K. Monro, then working in my laboratory, undertook the histological examination of the case, and you will find a careful account of his observations in the *Glasgow Medical Journal* for May, 1892, at p. 353. I may say that the chief lesions were found in the spleen and in the bone-marrow. The spleen weighed 8 lb., 2½ oz., and its dimensions were—length, 13½ inches; breadth, 8 inches; and antero-posterior diameter, 5 inches. One half of the organ, which I now show you, has been preserved in our Museum, and you can appreciate the enormous enlargement which had taken place. This coloured drawing, executed by my sister, Mrs. J. H. Connell, gives a faithful picture of the appearances in the fresh state. The cut surface had an appearance somewhat like that of red marble, a mixture of red and white areas of various shapes and sizes. The large yellow caseous-looking patches of irregular shape, resembling very closely embolic infarctions, are areas of necrosis. Dr. Monro found that, while the Malpighian bodies were scanty, a great new formation of lymphatic tissue had taken place throughout the pulp. Here and there the sinuses of the pulp were filled with leucocytes in larger numbers than the red blood corpuscles. The leucocytes in the sinuses were

often very large, and sometimes contained pigment. The necrotic and the living portions of the splenic tissue alternated with one another in an irregular fashion. The fibrous tissue of the pulp was infiltrated in many places with pigment of a brownish-red colour. I have thus somewhat fully summarised the detailed description of the spleen in this case, because I think you may take it that the spleen of our patient is likely to be in much the same condition. The marrow of the shaft of the femur was replaced by lymphatic tissue, which, however, had not in any way destroyed the bone. All the capillaries of the organs examined were found to be crowded with white blood corpuscles, but except in the spleen and the bone marrow there was very little new formation of lymphatic tissue. I may add, also, that the patient had suffered from malaria.

The other *post-mortem* case of leukæmia occurred many years ago when I was assistant to Professor Joseph Coats at the Western Infirmary. At that time the distinction between the different varieties of leucocytes had not been definitely formulated, but as I made and frequently examined many sections of the tissues in this case, I can now see that it was a very characteristic example of the lymphatic or lymphæmic variety of leukæmia. New formations of lymphoid tissue were very abundantly present in most of the tissues and organs of the body, a circumstance in striking contrast with the histology of the splenic case examined by Dr. Monro. In the kidneys, in the liver, and in the pericardium, as well as in the spleen and the bone-marrow, typical new-growths of lymphoid tissue could easily be demonstrated, whilst the dense overcrowding of the capillaries with leucocytes could not be so easily made out. The lymphatic glands in this case were also enlarged, apparently from a hypertrophy of their tissue. This is the class of case which is likely to give rise to the discussion of the possible relationship of lymphatic leukæmia to Hodgkin's disease.

Having thus briefly referred to the anatomical peculiarities of the two chief forms of leukæmia, as illustrated by cases occurring within my own experience, I desire now to describe

more in detail the characters of the blood in our patient's case. The specimens under the microscopes have been very carefully and beautifully stained by my assistant, Dr. Walter K. Hunter, who has devoted much attention to the clinical examination of the blood. In these specimens you will easily make out all the characteristic corpuscles met with in splenic leukæmia. You will observe :—

1. That the red blood corpuscles are, on the whole, normal in size and shape. Here and there nucleated red blood corpuscles are to be seen.

2. That eosinophile corpuscles are fairly numerous, the red eosin-stained granules of the protoplasm and the pale blue nucleus imparting to these cells a striking and beautiful appearance. Sometimes you will notice that the corpuscle has burst, scattering the eosinophile granules over a moderately wide area of the field.

3. That polynuclear leucocytes, with their nodulated irregularly-shaped nuclei of a deep blue colour and their pale pink protoplasm, are numerous.

4. That large mononuclear leucocytes, often almost entirely filled by a pale blue nucleus—the so-called myelogenous or marrow cells—are the most numerous of all.

5. That lymphocytes, the small mononuclear leucocytes, are almost absent, only one or two being very occasionally observed in a microscopical field.

It is not my intention to discuss the staining reactions of the different forms of leucocytes, a subject of great importance and of which our knowledge has been greatly increased in recent years, and I content myself by informing you that Dr. Hunter has embodied his views in a paper, communicated to the Glasgow Medico-Chirurgical Society, which I hope you will soon be able to study in its published form in the *Glasgow Medical Journal*.[1] It is sufficient at present to say that the features of the blood in our case correspond in almost every detail with those described by other observers as characteristic of splenic leukæmia. From

[1] "On White Blood Corpuscles," *Glasgow Medical Journal*, May, 1898, p. 321.

the mieroscopical appearances which you have just made out, I think it would be possible, without other help, to diagnose the disease. Let me now very briefly indicate to you the eharaeters of the blood in the lymphatie variety of the disease. Lymphoeytes are enormously inereased in number. Polynuelear leueocytes are not more numerous than usual, and eosinophile eorpuseles are very scanty. Myelogenous or marrow eells are not met with, and nueleated red blood corpuscles, except when anæmia is a marked feature, are not present. You will see, then, that by a careful examination of the blood alone it is possible to distinguish the two varieties of leukæmia. The mere presenee of enlarged lymphatie glands would be insuffieient, for, as you have to-day seen, the glands may be swollen in eharacteristie cases of the spleno-myelogenous variety.

There are, however, some other points eonneeted with the blood in our patient's case to whieh I desire to direct your attention. In view of the clear elinical history of malaria, a earefnl seareh has been made by Dr. Hunter for the plasmodium malariæ, but entirely without suceess. This, as I shall point out later, is a point of some importanee. I direeted your attention a little ago to the pigment found in the spleen in Dr. Robertson's case. Melanin granules are familiar objects in the histology of ague, as I have seen on several occasions, and it is possible that the somewhat extensive prevalence of pigmentation in the spleen in Dr. Robertson's ease may have been due to the malaria. In our case, however, no pigment granules were found in the blood.

We also earefully examined the blood for other mieroorganisms. In speeimens of fresh blood mounted by Dr. W. K. Hunter and by my resident assistant, Dr. Wm. Martin, I saw on several oeeasions, with the one-twelfth oil immersion lens of Leitz, aetively moving mierocoeei. Every precaution was taken to prevent contamination of the drop of blood, by sterilising the finger, the slides, and instruments, and it might be fairly presumed that we had succeeded in preventing the aeeidental introduetion of germs. The movements of the minute round bodies were not Brownian;

upon that we were all agreed. Many attempts were made to cultivate germs from the blood, but without success. All the tubes remained sterile after lengthened periods in the incubator, a proof, I think, that germs had not been introduced from the outside. Dr. Hunter, however, who has succeeded in cultivating germs from the blood in cases of beri-beri, informs me that the cultivation of germs from the blood is a matter of great difficulty, so that our want of success need not discourage us unduly in reference to future attempts. Meanwhile, with the exception of the observation of motile micrococci in the freshly-drawn specimen, our efforts to demonstrate organisms in the blood of leukæmia have been without result.

I shall conclude this lecture by making a few general remarks upon the etiology, symptoms, and course of the disease we have been studying to-day.

As regards etiology, it must be admitted that we know very little, and the only point under this heading which I desire to discuss is the relationship of leukæmia to malaria. That there is a relationship may be admitted. In two at least of my five cases there was a clear clinical history of antecedent attacks of ague. On this point, in the paper before referred to, Dr. T. K. Monro writes as follows:—"A study even of the earliest recorded cases of leukæmia—as, for instance, those collected in Bennett's work on the subject—suggests a connection between this disease and intermittent fever. Virchow remarked on this as early as 1852 (*Archiv* for 1853, vol. v, p. 95). In a discussion at the Pathological Society of London in the year 1878, Gull, Gowers, and Goodhart all expressed their belief in such a relationship. Gowers stated that there was a history of ague, or of residence in a malarial district, in 25 per cent of the cases of splenic leukæmia which he had collected (*Lancet*, 1878, vol. i, pp. 460 and 495)." Notwithstanding the frequency with which malaria forms an event in the clinical history of leukæmia, its etiological significance has been doubted by certain writers, and I may read to you Osler's opinion as expressed in *Pepper's Text-book of Medicine*, vol. ii,

p. 215: "That malaria and syphilis bear any etiological relation to leukæmia is scarcely probable, although in 150 cases analysed by Gowers, 30 had a malarial history, and over one-third of my cases had previously suffered from malarial invasion." I must say, however, that, on theoretical considerations, the possibility of leukæmia resulting from a miasmatic poison is a view which recommends itself to me.

Among the prominent initial symptoms of our patient's case you will recollect that diarrhœa was one. Gastro-intestinal symptoms are not uncommon as early manifestations of the disease, and it has been suggested that this circumstance may not be without etiological significance. It is possible that the affected intestine may be the "gateway of entrance (infection-atrium) for the leukæmic virus" (Osler). In favour of such a view as to the significance of initial diarrhœa or dysentery I may refer you to the frequency with which various forms of anæmia and toxæmic jaundice are associated with structural lesions or functional disturbances of the alimentary canal.

In this connection all of you will remember a clinical lecture, which I delivered to you during the present session, on a case of toxæmic jaundice, which proved fatal in the ward, and which we thought might have been due to acute atrophy of the liver. In this case there was no obvious obstruction to account for the deep jaundice, but on microscopical examination we found the capillary bile-ducts obstructed by inspissated bile. The patient had suffered from an initial diarrhœa, and the colon was beset by numerous small superficial circular ulcers, from which poisonous toxins may have been absorbed and carried to the liver.

Dr. Monro discovered in the retina of the left eye of our patient a flame-shaped hæmorrhage. This leads me to say that hæmorrhages—epistaxis, hæmatemesis, melæna—are not at all infrequent symptoms of leukæmia. In this connection the practical point I desire to impress upon you is that you should never undertake even the most simple cutting operation on a patient suffering from splenic leukæmia without recollecting, and preparing yourself for, the circumstance that you may have great difficulty in arresting the hæmorrhage.

In one of my cases I had unfortunately an experience of the truth of this observation. The man developed an abscess in the parotid region, and I requested my surgical colleague, Mr. Henry E. Clark, to open it for me. This he did, evacuating a large quantity of pus. Soon after, however, the abscess cavity was filled with blood, and it was only with the greatest difficulty, and when the patient had been reduced to death's door, that we succeeded in arresting the hæmorrhage. Please remember this experience of mine if you are ever called upon to deal with a similar case.

With regard to the course of splenic leukæmia, I have to point out to you that the disease progresses, as a rule, slowly. During the two months that our patient has been under observation his condition has undergone but little change, with the exception that the spleen is now much larger than it was at the time of admission. Osler points out that "the majority of cases terminate fatally in two or three years," although during that time there may be intervals during which the patient enjoys fairly good health. Lymphatic leukæmia, on the other hand, is said to run a much more rapid course, and in some very acute cases death may ensue in a few days or weeks.

As regards the treatment of the disease it must be admitted that on the whole we have been able to accomplish very little. In addition to regimen and hygienic measures, I think you will obtain the most beneficial results from the cautious and persistent use of Fowler's solution, in doses of about 5 minims administered three times a day, and stopped when physiological effects show themselves. There could be no harm in trying the effect of the administration of bone marrow or splenic extract, numerous preparations of which are now in the market, but of these I have had no special experience in the treatment of leukæmia. Above all, do nothing which in any way is likely in any way to interfere with the patient's general health or upset his digestion.

LECTURE XV.

PROFUSE HÆMATEMESIS DUE TO "PORE-LIKE" EROSION OF THE GASTRIC ARTERIES—NO ROUND ULCER—EXULCERATIO SIMPLEX OF DIEULAFOY.[1]

In the following remarks I intend to call your attention to a lesion giving rise to sudden profuse hæmatemesis, which, though perhaps not an uncommon one, is probably not often thought of in connection with severe bleedings from the stomach. Further, the nature of the cases in which this lesion occurs, from the great ease with which it may be overlooked even at the *post-mortem* examination, may be erroneously explained, or perhaps not explained at all. It has recently been my lot to have had under my care a number of cases of very severe hæmorrhage from the stomach, so severe as in all of them at once to threaten the lives of the patients, and as two of them unfortunately came to a *post-mortem* examination, I have thought it right to bring before you the clinical and pathological notes in detail. The usual causes of hæmorrhage into the stomach are so well known that, whenever we meet with a case, we almost invariably think of one or two well recognised lesions, such as simple perforating ulcer, malignant ulcer, or hyperæmia due to portal obstruction. To none of these categories, however, do the cases I am about to demonstrate belong. Any of the lesions I have mentioned may give rise to profuse and sudden effusion of blood into the cavity of the stomach, and it is natural that we should think of them when such cases occur, and equally so that we should be

[1] Delivered November, 1898.

surprised when the autopsy shows that they are not present. In both of my eases, during the lives of the patients, perforating uleer was regarded as the most likely eause of the hæmorrhage, but in neither of them was an uleer of the ordinary type present. Even a eursory examination of the literature of hæmatemesis eonvinees us that this is not an uneommon experienee, and in not a few eases the apparently healthy state of the stomaeh as demonstrated *post-mortem* has led the observers to suppose that the bleeding may have been due either to vaso-motor disturbanee or to exhalation from the vessels. It is in the hope that the details I am now to submit may throw some light both on diagnosis and treatment that I bring these eases before you.

Case I.—*Profuse hæmatemesis due to "pore-like" erosion of a branch of the gastric artery—Arrest of the bleeding under rectal feeding and subcutaneous saline injection—Death soon after from exhaustion due to uncontrollable diarrhœa.*

Mrs. G., æt. 28, a housewife, was admitted to Ward 8 of the Royal Infirmary on 24th Oetober, 1898, eomplaining of a vomiting of blood whieh took plaee on Saturday, 22nd Oetober.

Up till four weeks before admission the patient had enjoyed good health, and, in partieular, no history of gastrie symptoms before this time eould be obtained. Four weeks before her admission she first experieneed anorexia and pain after food, the pain beginning seven or eight minutes after a meal, lasting for about an hour, and not being very severe. A week before admission a paroxysm of pain oeeurred about 4 o'eloek in the morning, obliging her to get out of bed. In about half an hour she beeame sick, and vomited profusely for the first time. She was ignorant of the eharaeter of the vomit, but she notieed no blood-stains on her elothing afterwards. The vomited material had a bitter taste. All that day the pain in the stomach was very severe and anorexia eomplete. The pain remained severe during the following week, and though going about, she was very weak and unable to take food.

On Friday, 21st October, she did much housework, and on Saturday, although feeling very weak and sick, she continued at her household duties till about 1 o'clock in the afternoon, when she was forced to lie down. Shortly afterwards she began to vomit blood, the blood being put up in two large gushes, amounting in all to about 1 pint. She was admitted on Monday (24th) without any recurrence of the hæmatemesis having taken place in the meantime. The bowels were naturally constipated, and she had never observed anything resembling blood in the motions.

On admission she was found to be a sparely-built woman, on the whole fairly well-nourished, but presenting considerable pallor of the skin and mucous membranes. The tongue was clean, but there was a slightly fœtid odour in the breath. The pulse numbered 100 and was somewhat soft. The respirations were 24, and unembarrassed. The temperature on admission was 98° F. There was no tenderness on pressure in the epigastrium, and nothing abnormal either here or elsewhere in the abdomen could be made out on physical examination. The heart and lungs presented healthy characters, as did likewise the urine, which contained neither albumen nor sugar.

The foregoing account is from the clinical report by Dr. George Coats, house physician. I saw the patient at 9·30 P.M. on the evening of her admission, and entered the following account of her condition in the ward journal:—

24th October.—During the afternoon the patient rested in bed without apparently being very ill in any way. About 8·10 P.M., while endeavouring to pass urine, she suddenly became sick and vomited violently. The vomited material consisted almost entirely of bright red blood, a large portion of which went on the floor. The part seen by Dr. J. Lindsay Steven measured 12 oz., and consisted almost entirely of pure blood-clot mixed with a little curdled milk which she had been receiving in small quantities at intervals of an hour or two since 2 P.M. When seen at 9 P.M. the patient was quite collected, and not giving the impression of extreme collapse. She does not complain of thirst; since Saturday (22nd October),

however, she has had slight occasional dimness of vision and lightness in the head.

The pulse is small, but of very fair tension and regular in force and rhythm, numbering 90 per minute. The tongue is quite clean, although the breath is still rather fœtid. Pallor is more marked on the face than on the lips, which are fairly coloured. The abdominal wall is relaxed, suggestive indeed of slight emaciation. No tenderness anywhere discovered, and no fulness or hardness at any point. The patient is quite decided that her gastric symptoms are only of four weeks' duration, and that, with the exception of the hæmatemesis on the 22nd, she had only vomited once before this, as described in Dr. Coats' report. She thinks that on this first occasion it was bile she vomited, from its bitter taste.

A detailed physical examination is impossible, but Dr. J. Lindsay Steven is of opinion that, as regards the hæmatemesis, the heart and lungs may be regarded as normal. She declares that she is not the subject of a chronic cough. She cannot blame anything for causing her illness, but her circumstances are rather poor.

The treatment then ordered was as follows. She was to receive absolutely nothing by the mouth except small pieces of ice occasionally. In the event of failure of the pulse, brandy *per rectum* was to be administered; one-sixth of a grain of morphia hypodermically if she were restless; and in the event of a recurrence of the hæmorrhage, Dr. Coats was instructed to practise subcutaneous injection of saline fluid to 1 pint.

25th October.—General condition very satisfactory. Pulse of very fair tension, the patient not being in any way collapsed. A fair amount of sleep during the night, and, except of debility, no complaint to make. This morning, in response to an enema, a large quantity of tarry material, partly formed, partly loose, was passed from the intestines. Nourishment by means of nutrient suppositories and enemata every three hours was commenced to-day.

She remained very well until 28th October, receiving nothing but small pieces of ice by the mouth. During the visit on

that morning I witnessed an attack of hæmatemesis, in which 15 oz. of pure bright blood were evacuated. After this the patient was very collapsed, and she was treated by the administration of 20 minims of turpentine and half an ounce of brandy *per rectum*, one-sixth of a grain of morphia hypodermically, and the injection of 1 pint of saline solution subcutaneously.

During the afternoon of 28th October the patient had two additional hæmorrhages, amounting in one to 1½ oz., in the other to 4 oz., and saline injection was again practised in the evening.

3rd November.—The patient progressed very satisfactorily from the period of the last hæmatemesis until 1st November, having been fed during the whole period of residence entirely by the rectum. On 31st October a moderate diarrhœa set in, and on the 1st of November it had been determined at the visit to begin milk by the mouth in 1 drachm doses. Until this morning the bowels have been moved seven or eight times each day, the motions being normal in colour, but exceedingly offensive—without any tarry condition. A slight elevation of temperature also on the night of 2nd November and morning of 3rd November (a maximum of 101·2° being reached) took place. During this period of fever and diarrhœa the pulse has ranged from 120 to 130.

There has been no return of hæmatemesis.

7th November.—Since above note patient has become progressively weak, and she died this afternoon. The diarrhœa mentioned above proved uncontrollable, laudanum and astringents having little effect on it. Latterly the bowels have been running practically constantly. The pulse has ranged between 120 and 140, but for two days has been sometimes imperceptible. A very offensive smell was exhaled from patient. Temperature rose to 100·6° just at death. Hiccough was present for about twenty-four hours before she died, but was not severe.

Summary of post-mortem examination.—The peritoneal cavity, as a whole, presented healthy characters. Examination of the peritoneal aspect of the stomach wall and of the

pylorie and duodenal regions, both anteriorly and posteriorly, revealed no traee of abnormality. The œsophagus and duodenum presented quite healthy eharacters; the mueous membrane of the stomaeh also, as a whole, was quite normal in appearanee. On the posterior surfaee, about 4 ineches above the pylorus and $1\frac{1}{2}$ ineh below the lesser eurvature, a very superfieial abrasion, about a quarter of an ineh in length and one-eighth of an ineh in breadth, was diseovered.

There was no thiekening of the floor or edges of the abrasion, and no redness around it. In the middle of the abraded area two pin-hole openings were observed, through whieh a bristle was direetly passed (as is now seen in the preparation) into one of the primary lateral branehes of the gastric artery. This might very readily have been missed from the very healthy eharaeter of the mueous membrane surrounding it. Evidenee of slight eatarrh of the intestines was present, but no blood was found in them.

There was eonsiderable œdema towards the bases of the lungs, and old fibrous adhesions over the lower lobe of right were present, but the other organs presented nothing abnormal, with the exeeption of great anæmia.

Case II.—*Profuse hæmatemesis due to "pore-like" erosion of a branch of the left gastro-epiploic artery—Laparotomy—Death due to hæmorrhage, about 96 oz. of blood having been lost while under observation in the ward.*

W. S., 38, a vanman, was admitted to Ward 7 on the 17th April, 1898, on aeeount of a severe vomiting of blood whieh had suddenly eome upon him while walking in the street, and apparently without warning of any kind. An ambulanee attendant who saw the blood estimated its quantity at from two to three pints. He was mueh eollapsed when admitted at 10 P.M., but was quite elear that the blood had been vomited and not eoughed up, the evaeuation having been preeeded by distinet siekness.

On the morning of the 18th I made the following note:—

No further external hæmorrhage oeeurred from the time of admission until about 8 o'eloek this morning, when he felt

sick, and asked for the bedpan. Vomiting and movement of the bowels occurred practically simultaneously. The vomited matter consisted almost entirely of pure blood diluted somewhat with thin, watery mucous fluid, but coagulating rapidly into thin large clots. Vomiting occurred twice, with an interval of about half an hour, the total quantity being about 40 oz. The motion consisted of black, tarry-looking matter, and was probably about 2 pints in quantity; since this he has retched twice, but has not vomited. At the visit this morning, the patient is found to be pale and somewhat drowsy, the pupils being contracted, evidently the result of a hypodermic injection of a quarter of a grain of morphia administered at the time of the hæmatemesis.

The tongue is pale, and coated with a buff coloured fur; the pulse is quick, small, compressible, numbering about 120 per minute. The heart sounds are feeble, only the second being easily heard; there is no murmur.

The chest is well formed, and no abnormality of the lungs is detected. It is not considered advisable to palpate the abdomen freely, but a superficial physical examination of the epigastric region reveals nothing abnormal, and the patient makes no complaint of pain on manipulation. On enquiry, one or two details of clinical history are elicited:—For some time past, he does not know how long, he has been occasionally liable to severe spasms of colicky pain in the bowels, each attack not lasting long. He said nothing to anybody about these attacks. During the week before admission he had been idle, and had probably been drinking more than usual. The hæmatemesis took place without warning whilst he was out walking with his brother. He is perfectly clear that he vomited the blood, and did not cough it up, and that the vomiting was preceded by a sense of sickness.

During this morning, since the vomiting, he has been somewhat restless, but has made no complaint of pain.

20th April.—The patient had remained fairly well till this morning, when, at 8 A.M., 21 oz. of fluid blood were vomited. Careful physical examination of the abdomen was absolutely negative. The pulse remained of fair volume, but was easily

eompressible, numbering 110 per minute. Pallor is very great. Temperature subfebrile in character, ranging between 99° and 100°.

21st April.—During the day smaller quantities of blood had been constantly put up, and the total evaeuated sinee yesterday morning at 8 A.M. is 43½ oz. Mr. Pringle saw the patient in eonsultation with me this forenoon, and it was agreed then that if further evaeuation of blood oecurred operation should be undertaken, with a view, if possible, to securing the bleeding point or surfaee. One ounce of blood was brought up about 4 P.M., and at 8 P.M., in my presenee, Mr. Pringle performed laparotomy, examining the stomaeh externally, and, after opening it, exploring the interior with the finger, but nothing could be found. The transverse eolon was distended and dark-looking, apparently from blood in its interior. The patient died about an hour and a half after the completion of the operation. The total amount of blood vomited during residenee in Ward 7 was 96 oz., in addition to a number of tarry motions.

On 22nd April, 1898, I was present while Mr. Pringle performed a *post-mortem* examination, and his deseription of the stomach is as follows:—There is a sutured wound in the anterior wall of the stomaeh, about 1½ ineh from the pylorus. The stomach is empty. About 2 inehes to left of the wound, 3½ inehes to 4 inches from the pylorus, and 1½ ineh up from the greater eurvature is a small depressed area about the size of a threepenny piece. In the eentre of this area an oblique opening into a vessel (a large braneh of the left gastro-epiploie artery) is seen, into whieh a bristle can be passed 2 inehes in one direction and 1 ineh in the other. There is no thiekening of the stomaeh around the depression, and the serous eoat over it is absolutely natural in appearanee. The other abdominal organs presented healthy characters. The depressed area scarcely deserved the name of an uleer. It was a mere superficial abrasion, whieh might altogether have been overlooked had it not been for a minute blood-elot adhering to its surface. With this exeeption the mucous membrane of the stomach presented quite healthy eharaeters.

The medieal treatment adopted in this ease was preeisely

similar to that adopted in Case I, with this exception that subcutaneous injection of saline solution was not practised.

The occurrence of the two cases which I have just described, and the specimen from the first of which I have demonstrated, made a profound impression upon my mind, chiefly on account of the minuteness of the lesion capable of producing such disastrous results. That such a lesion may not be at all an uncommon one I can well believe, but that it has not been very frequently described is at once apparent from a glance into the literature of hæmatemesis. In consulting the various accounts of profuse and fatal bleeding from the stomach which were available to me, I find a certain number of cases on record in which no lesion could be found at the *post-mortem* examination, the mucous membrane of the stomach being regarded as healthy. Now, it is quite possible that in such cases there may have been a minute pin-hole opening of one of the arteries which had escaped notice. In certain other records, to the titles alone of which I have been able to obtain access, I judge that the lesion giving rise to the hæmorrhage was of a nature precisely similar to that I have been describing in this lecture. Thus, Chiari, of Prague (*Prag. Med. Wochenschr.*, 1882, vii, 489), describes a case of fatal hæmatemesis under the following heading:—"Fatal bleeding from the stomach resulting from the erosion of a submucous vein within an abrasion of the mucous membrane only the size of a large barleycorn." Again, Ferrand (*Bull. et Mem. Soc. Med. d. hôp. de Par.*, 1895, 3, S. xii, 309-312) describes a case of "abundant hæmatemesis without ulcer properly so-called," a mode of description perfectly applicable to both of my cases. In the *Pathological Transactions*, 1870, vol. xxi, p. 162, Dr. Murchison described two cases of fatal hæmatemesis from very minute ulcers perforating a small artery in the coats of the stomach. Dr. Murchison writes with regard to them—"They are remarkable, not only for the minuteness of the ulcers, which were little more than hæmorrhagic erosions, but also for the absence of the usual symptoms of ulceration of the stomach. Neither of the patients had suffered from vomiting prior to the occurrence

of the hæmorrhage." But, beyond all doubt, one of the most important communications on this very serious lesion is that by Dieulafoy in the *Bulletin de l'Academie de Médecine*, 3e serie, tome xxxix, 18th January, 1898, p. 49, entitled "Exulecratio Simplex." The paper contains an aeeount of seven cases whieh are similar in all essential dctails to those I have brought under your noticc. Two of the eases wcre under his own eare, and one was saved by opening the stomach and securing the bleeding point. In both of these eases he had expeeted to find the simple uleer of Cruveilhier; he *had* found only an exulceration, more or less extensive and exceedingly superficial, which had penetrated an artery by an opening sufficient to allow a pin to be introduced. Two of the seven cases were subjected to careful histological investigation by Dieulafoy's assistants, and the details will be found in the paper. It is sufficient to indicate that only the mueous membrane and the muscularis mucosæ were involved in the abrasion, which did not involve, except very partially, the submucosa, and that in one ease the perforated artery was found to be quite healthy. Small miliary abscesses were detected in the neighbourhood of the abrasion, which Dieulafoy regarded as the initial stage of the lesion. As regards diagnosis the lesion was to be distinguished, in his opinion, from tubercular, syphilitic, and typhoid ulceration; and while proposing the name "exulceratio simplex," Professor Dieulafoy writes that as regards the essential nature of the lesion he regards it as the initial stage of the simple uleer of Cruveilhier.

I shall conelude this lecture by making a few observations upon certain praetical points bearing upon the diagnosis and treatment of the lesion I have been describing.

As regards diagnosis, the first point to be eommented upon is the exeeedingly profuse eharacter of the hæmorrhage, which in both of our cases from the first threatened the lives of the patients; and, in the second, may be said to have been the primary cause of death. That such exceedingly profuse hæmorrhage may occur in the simple perforating ulcer cannot be doubted; but, on the whole, I think it is not so likely to

occur, as the morbid condition of the tissues in the wall of the round ulcer is more likely to induce a thrombosis, which may either prevent the hæmorrhage altogether, or, when it does occur, may more readily lead to its arrest.

The second point of diagnostic importance is the comparative absence of antecedent gastric symptoms. That this also may be characteristic of the development of the round ulcer cannot be doubted; but in most cases a careful enquiry will reveal the existence, usually during a considerable period of time, of some of the symptoms of round ulcer. In our second case it may be admitted that these were entirely absent; in the first, gastric symptoms had only been present for four weeks altogether, and became urgent for the first time about a week before the first hæmorrhage. Further, it can hardly be said that the symptoms detailed in the clinical history were characteristically those of the round ulcer.

Hæmorrhage, sometimes of a very profuse kind, from the stomach may result from the presence of malignant ulcers, from hyperæmia due to portal obstruction arising from cirrhosis of the liver, or from varicose veins of the stomach. As regards the two former conditions, difficulties of diagnosis are not likely to be great; as to the latter, I have no personal experience, but I should think that the difficulties of detecting the true source of the bleeding during life would be considerable.

With regard to the nature of the "pore-like" erosion of the gastric vessels which has been made the subject of this lecture, I am very much inclined to agree with Dieulafoy in thinking that the lesion is probably the initial stage of the simple round ulcer of Cruveilhier.

The treatment of the condition must always be a matter of the gravest concern to the physician. Our first case shows, I think, that under medical measures the bleeding may be arrested. But possibly this may be effected only when the vital powers are so exhausted that the ultimate recovery may for long be a matter of doubt. So it happened in our case. No doubt surgical interference with the view of securing the bleeding point would be the best method of dealing with such cases, but even here the result must often be problematical.

To be of service the operation must be done early, and sometimes this is not possible. But perhaps a greater difficulty is the uncertainty of finding the bleeding point when the stomach is opened. Our cases show that the lesion is not one which is liable to occur in any particular region of the viscus, and this still further increases the difficulties in the way of a successful result. However, Dieulafoy has had one successful result, and I must say that if a case similar to the second reported in this lecture were to occur to me again, I would recommend an operation at the earliest possible date.

APPENDIX.

CASE OF SCLERODERMA WITH PRONOUNCED HEMIATROPHY OF THE FACE, BODY, AND EXTREMITIES—DEATH FROM OVARIAN TUMOUR—ACCOUNT OF THE POST-MORTEM EXAMINATION: A SEQUEL.

In the following lecture I intend to give an account of the subsequent clinical history and of the *post-mortem* examination of the case of scleroderma with hemiatrophy, which was made the subject of clinical lecture (see p. 130) on 2nd April, 1897. The clinical lecture which I then delivered contains a full record of the clinical history up till the date of its delivery. About this time the patient went home, but in the spring of 1898 she had again to seek admission to Ward 8 of the Glasgow Royal Infirmary on account of the urgency of several symptoms. As regards her clinical condition, there were at this time two sets of symptoms demanding attention.

1. On examining the skin it was found that ulceration had again occurred in the affected arm and leg. These ulcers had made their appearance as far back as September, 1897, when the skin over the outer tuberosity of the tibia gave way. In January, 1898, another ulcer appeared on the back of the right wrist, exposing the extensor tendons of the thumb, and, at times, causing the most acute pain. Both of these ulcers were present at the time of her readmission in April, 1898. Both of them slowly healed under appropriate dressings, that on the leg first; and as regards their general characters, they recalled the clinical features of the ulceration which was so extensive during the earlier years of the malady, and which I have

already fully described in my previous lecture. Otherwise the condition of the skin and the hemiatrophy presented no very great difference from that already recorded, and her general condition was much as before.

2. In addition to the skin troubles, however, she now complained of a swelling and weight in the abdomen. On investigation, this was found to be due to the presence of an ovarian tumour. As the tumour grew rapidly, and became more painful in the ward, I had her removed to the ward of my surgical colleague, Mr. J. H. Pringle, to whom I am indebted for the clinical history of this part of the case.

"In August last (1897) she first noticed a swelling in the abdomen; she could not say definitely that it began on any particular side, and had the impression that it was first noticed about the middle of the lower part of abdomen. Between August and the date of her admission to the medical house it increased slowly and steadily in size. During her stay in the medical ward it increased to about twice the size it was on admission. She never had any pain in the abdomen till two months before admission. Since then she had pain over the region of the present swelling, which at times was very sharp and of a stabbing character; at other times throbbing. She had no trouble with micturition; the bowels had always been constipated for several years. She states that menstruation was diminished at the period before admission to the surgical house, and was very pale in colour.

"Beginning last August (1897), she had vomited, principally in the mornings, two or three times per week at first; occasionally this occurred in the evenings. During the last three months vomiting has not been so frequent, but she had vomited several times since admission.

"The abdomen, on physical examination, showed a fulness in the lower half, the fulness extending from the umbilicus downwards to the pubic rami; there was slight fulness also in both flanks. The veins were prominent on the right side of the abdomen, but not on the left. Palpation revealed a swelling, the upper margin of which was just at the level of the umbilicus, and passed downwards and outwards on each

side. It had a smooth, nodulated surface, and gave the impression that it contained fluid. There was a distinct thrill obtained on tapping with the finger. On percussion, the upper limit was about the level of the umbilicus, passing downwards and outwards towards each anterior superior spine of the ilium. Each iliac region was dull to percussion, this being continuous with the dulness in each flank. Above the level of the swelling the percussion note was quite tympanitic. Each flank was quite dull when the patient lay on her back, and became resonant when she turned on the opposite side. Palpation of the swelling showed that it narrowed down towards the symphysis; palpation was painless.

"On vaginal examination, fulness in the anterior fornix was discovered; the temperature of the vagina was slightly elevated; the os uteri was smooth, hard, and small. On bimanual examination, the cervix descended when the abdominal swelling was pressed downwards; the uterus was pushed down to the right side, and the tumour was felt above it. On pressing the cervix upwards the swelling was moved further up into the abdomen. The right ovary was distinctly made out, but not the left.

"Abdominal section was performed for the removal of the tumour, when a multilocular ovarian cyst was found. It pushed the uterus down towards the right, as it grew from the left ovary. The tumour had to be tapped before removal, and a large quantity of colourless thick fluid escaped. The right ovary was left, although two or three small cysts were found in it.

"On the day after the operation she complained much of pain; she had also considerable vomiting, and the temperature rose to 103° F. in the evening. Flatus was passed freely on morning after operation, but the temperature rose to 104° F. on the second day after operation. The abdominal wound was therefore opened on the second day; no fluid was found in the peritoneal cavity; a small blood-clot was discovered over of the site of the pedicle; a Keith's drainage-tube was inserted, and the abdomen closed. She died early next morning."[1]

[1] This clinical report of the ovarian tumour was prepared by the resident surgeon, Dr. A. H. Edwards.

A *post-mortem* examination of the body was made by Dr. Charles Workman, pathologist to the Infirmary, whose report I shall read in full:—

"Summary.—*Scleroderma and hemiatrophy of right side of both face and limbs—Absence of pericardium—Atrophy of heart—Granular kidneys—Fatty anæmic liver—Cicatrices in spleen—Prominent Peyer's patches—Ulceration of cæcum—Stricture of œsophagus.*

"*External appearances.*—Somewhat emaciated body, with great atrophy of right arm and leg and of right side of face and head, together with hardening and atrophy of the skin. In the affected parts at many points there are cicatrices from old ulceration.

"*Thorax.*—On opening this cavity the heart is at once exposed, the pericardium being entirely absent both from the heart and great vessels. The left lung is adherent to the wall of the left ventricle, and the right ventricle is covered with a rather thick coat of adipose tissue. The aortic and pulmonary curtains are competent, and these valves present very healthy characters. The mitral orifice is rather small, having a circumference of 105 mm. The tricuspid is also small (125 mm.), but otherwise these valves are healthy. The muscular tissue of the heart wall is very soft and pale. The right lung is very adherent over the apex from old and partly healed caseous tubercular disease of the apex. The rest of this lung presents fairly healthy characters. The left lung is adherent at several points to the heart and to the parietes by old fibrous pleural bands; on section the lung appears healthy. The œsophagus, about $2\frac{1}{2}$ inches above the level of the bifurcation of the trachea, presents a stricture, the gullet at this point having a circumference of only half an inch. The stricture is cicatricial in character, not at all rigid, and without marked thickening of the œsophageal wall. The trachea and bronchi are congested, but otherwise healthy.

"*Abdomen.*—There is an operation wound extending from about the umbilicus to near the pubis in the middle line. On opening the abdominal cavity the loops of bowel are found somewhat adherent to one another from an acute peritonitis.

The sigmoid flexure is closely adherent to the stump of the left ovary and Fallopian tube. The uterus, right ovary, Fallopian tube, and bladder appear fairly healthy, though there are a few very small cysts in the ovary.

"The stomach is normal in size, and presents very healthy characters. The duodenum and pancreas and suprarenal bodies also appear healthy.

"The liver is very anæmic, and shows a mottling evidently due to some fatty change. The gall-bladder contains fluid bile, which escapes easily into the duodenum on pressure.

"The spleen is moderate in size, and shows two cicatrices which have some resemblance to healed infarction. On cutting into them they are seen to be of a deep yellow-brown colour.

"The kidneys are large, granular and irregular on the surfaces, probably from a mixed parenchymatous and interstitial nephritis; their capsules are adherent. Portions of the iliac vessels are removed and compared. The left are seen to be distinctly larger than the right. Portions of the lumbar nerves of the right side and of the right brachial plexus are removed for microscopic examination.

"*Head.*—On removing the calvarium the dura is seen to present quite healthy characters. The fluid in the soft membranes is seen to be somewhat in excess. No irregularity can be made out between the hemispheres. On removing the brain the moulding of the cerebellum seemed to be more deficient around the medulla on the left than on the right side, but otherwise the lobes appeared quite equal. The brain is preserved in formol-Müller fluid for further examination. The cord, which appears slightly congested, is preserved in formol by Dr. Hunter along with the medulla and pons varolii. The brain is cut into slices to-day, and the only possible abnormality evident to naked eye examination is that the cortex of the motor area is perhaps very slightly thinner in the left hemisphere than in the right."

I shall now read to you the report by my clinical assistant, Dr. Walter K. Hunter, of his microscopical examination of the nervous system and other organs. I desire in this place

to acknowledge my great indebtedness to Dr. Hunter for his valuable help, without which it would have been impossible for me to submit to you this full report of a most interesting and very rare case. Dr. Hunter's report on the histology of the nervous tissues is of great importance because of the circumstance that he has devoted very great attention to the microscopical examination of the brain and spinal cord, and is familiar practically with all the more recent methods of staining. I may also say that on several occasions I have gone over all the sections with Dr. Hunter, and that I perfectly agree with the terms of his report.

"*Microscopic examination of pons, medulla, and cord, of nerves from right cervical and right lumbar plexuses, of sclerosed skin, of kidneys, and of spleen.*

"The *pons*, *medulla*, and *cord* were fixed in formol-Müller solution, and stained (1) according to Weigert's method, (2) with methylene blue, and (3) with Ehrlich's acid hæmatoxylin and acid fuchsin.

"Numerous sections from various levels of the cord were examined, and in each there was to be seen a slight, though undoubted, diminution in size of the right anterior cornu. The ganglion cells in this horn, besides being fewer in number than normal, presented signs of undergoing degeneration, in that their nucleus and plasma granules were not nearly so well defined as in the ganglion cells of the left horn. The neuroglia, too, in this right horn seemed denser than in the left. Changes corresponding to those just mentioned could not be made out with any certainty in either the medulla or pons.

"Throughout the cord, medulla, and pons, the arteries, especially those in the grey matter, were seen to be surrounded by certain spaces, sometimes containing a homogeneous, structureless material, and in some cases free of any such contents. On transverse section these spaces were round or oval in shape, and most of them had sharply-defined margins. The appearances they presented suggested dilated lymph spaces rather than a softening of the grey matter. They were best seen round the anastomotic arteries, and, on the whole, they were larger and more apparent on the right side of the cord

than on the left. In some of the sections the coats of the arteries lying in these spaces seemed thicker than normal, but in none of the sections was this sufficiently well marked to make the observation unequivocal.

"The *nerve fibres* from the cervical and lumbar plexuses showed a well-marked parenchymatous degeneration. This change was evidently recent, and almost certainly it has no connection with the more chronic changes found in the cord.

"Both *kidneys* presented unmistakeable signs of an interstitial nephritis. There was also evidence of a more recent parenchymatous inflammation.

"The *spleen* contained a blood-clot, but otherwise it was quite normal.

"The *intestine* was also normal.

"The *skin* showed almost complete absence of fat. The horny layer was thickened, and the papillæ atrophied and, in places, surrounded by groups of connective tissue corpuscles. Between the papillæ and the muscles there was a thick layer of dense connective tissue, with, here and there throughout it, groups of connective tissue corpuscles. These corpuscles seemed to be grouped round the vessels, round glands, and what seemed to be the remains of glands. The vessels were few in number, and their walls were very much thickened, some of them being distinctly atheromatous."

We have thus finished the record of a case observed more or less continuously over a period of twelve years, and I think it may be admitted that some light at least has been thrown upon the pathology of those obscure affections—sclerodcrma and hemiatrophy of the face and body. The full account by Dr. Workman of the *post-mortem* examination shows us that this patient was the subject of a number of abnormalities which, so far as I can judge, could have had no very direct connection with the disease which we have been studying so long in her case. The stricture of the gullet was caused by her having accidentally swallowed some vitriol when about 11 or 12 years of age, a fact in the clinical history to which I drew attention in my previous lecture. The absence of the

pericardium, although a very interesting anatomical abnormality, could not have had any direct bearing upon the hemiatrophy, although it is of some interest in connection with the affection of the arteries in the spinal cord and the skin; and the same may be said of the ovarian tumour and other organic lesions discovered at the autopsy.

The same, however, can hardly be said of the histological changes in the central nervous system so carefully demonstrated and described by Dr. W. K. Hunter. The atrophy of the right anterior horn of the grey matter, the changes in the multipolar nerve cells, and the cavities around the anastomotic arteries of the cord are lesions which I cannot help regarding as of the greatest importance in connection with the pathology of scleroderma and hemiatrophy. Dr. Hunter and I submitted the series of sections to Dr. Alexander Bruce, of Edinburgh, a very eminent authority upon the histology of the central nervous system, and he very kindly examined them along with us. As to the facts narrated in the report he agreed with us, but he was inclined to regard the perivascular spaces as, in some instances at least, due to localised softening of the nervous substance rather than to dilatation of the perivascular lymphatic channels. While, on careful reconsideration, we do not find ourselves able to agree entirely with this view as to their nature, we nevertheless attach great importance to the opinion of Dr. Bruce, and desire to put it on record. But whatever the essential nature of the perivascular cavities may be, I personally have no doubt that the microscopic changes observed in the cord are to be regarded as the primary cause of the development of this curious disease. In my previous lecture I made the following statement:—"So far as I have read, two views seem to be held as to the essential pathology of scleroderma: one that it is an affection of the skin brought about by a perversion of innervation, central or peripheral—a trophoneurosis; the other that it is caused by a chronic inflammation of the skin and subcutaneous tissues." In view of the facts observed *post-mortem* in our case, I think there can be no doubt of the truth of the former view that the disease is essentially a trophoneurosis, central, however, rather

than peripheral, as the parenchymatous degeneration of the peripheral nerves was evidently a recent phenomenon, whereas the central lesions were of long standing. It is quite clear, I think, that the peripheral neuritis observed in the cervical and lumbar plexuses of the affected side was acute, and therefore secondary, probably, to the pyrexial condition following the abdominal operation. The clinical history of the mode of onset of the disease and its distribution throughout the body are quite in keeping with this view of its pathology. Dr. Hunter's account of the histology of the affected skin agrees, on the whole, with that usually given; and the diseased condition of the vessels indicates vascular disturbance as one of the primary factors in the development of the cutaneous lesion. In this connection, also, the absence of the pericardium, as I have already remarked, is not, perhaps, without some significance.

As the result of our investigation of this case, I may be allowed to formulate the following conclusions as to the nature of the disease:—

1. Scleroderma with hemiatrophy, as regards its essential pathology, is a trophoneurosis due to changes occurring in the trophic cells of the central nervous system, certainly, as our sections demonstrate, in those of the spinal cord, and probably also, as Dr. Workman's observation of the slight thinning of the grey matter of the left motor area would seem to indicate, in those of the brain.

2. As the result of this change in the nerve cells, the blood-vessels, both of the cord and of the periphery, controlled by the diseased nerve cells are first of all affected.

3. Following upon the derangement of the blood supply caused by the central nervous disease, the atrophic changes in the skin and subjacent tissues are slowly developed.

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