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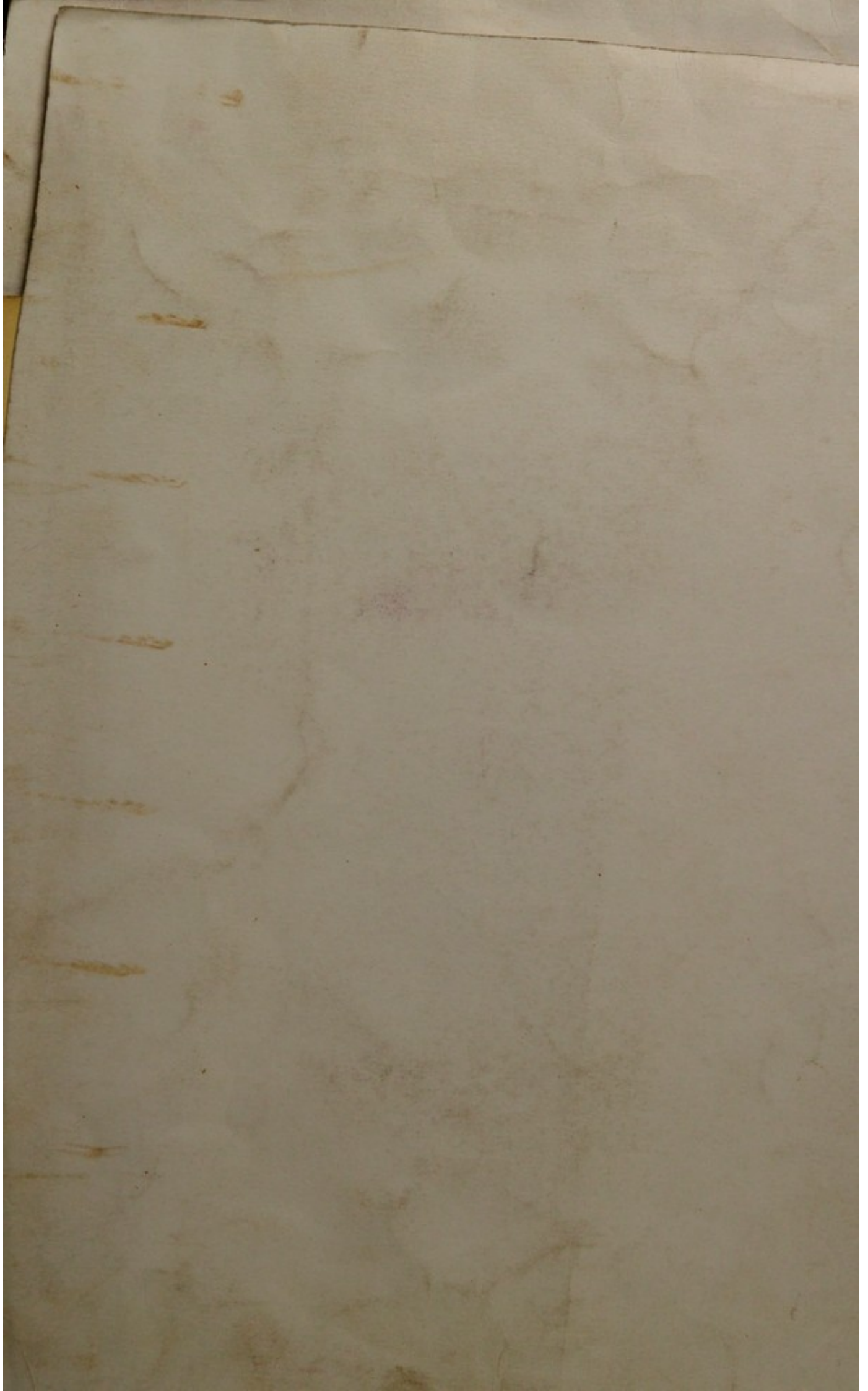
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MALIGNANT PUSTULE.

BY

ALFRED CARPENTER, M.D.

DURING twenty years of private practice it has been my fortune to meet with several cases of MALIGNANT PUSTULE, or the so-called "CHARBON." The last of these has been the most interesting, and it has presented several features so peculiar that I have thought it worthy of submission to the Medical Society of London.

English Literature upon the disease is meagre; there is a great difference of opinion among the few authors who have written upon it, both as to causation, and as to treatment. It appears to be an infrequent malady in this country at present; but it is probably oftener met with than used to be the case.

The first English writer who seems to have fully described it, was Mr. Harvey Ludlow. He wrote in the Medical Times and Gazette regarding it, in 1852. He called it a Carbuncular Inflammation of the lip.

Authors generally consider it as a disease little known among us, though Dr. Budd, of Bristol, gives a very good history of it in a comprehensive paper which he read at the meeting of the British Medical Association in London, in 1862. He published the history of a series of cases he had met with, and which from their frequency, would indicate that it is a malady either more common than it used to be, or not always recognized; for our text books speak of it as a disease common enough abroad, but almost unknown in England.

It was referred to by Sir James Paget in 1869. He described it as an inflammation commencing in the lip, and spreading to the face; disease of the lymphatics then ensued, and pyæmia followed as the consequence. Sir James mentioned fifteen cases; all occurring in young persons; all fatal, with one exception only. He strongly objected to the term Carbuncular Inflammation of the lip, agreed to that of Malignant Pustule, but did not distinctly refer its origin to infection.

In the nomenclature of diseases issued by the Royal College of Physicians, it is styled "Malignant Pustule," and defined as a "spreading gangrenous inflammation, commencing as a vesicle on exposed skin; attended with peculiar hardness and fœtor, and derived from cattle similarly diseased." In the list of causes, it is again distinctly stated to originate from animals having infectious disease. It is not given as a cause of death in the Registrar General's Report, but Dr. Farr has kindly furnished me with a return of the number of deaths which have been registered in England and Wales during the five years ending December, 1871, viz.,—in 1867, **6**; 1868, **3**; 1869, **4**; 1870, **3**; 1871, **5**:—Total, **21**. It may be that this return does not give a correct account, by reason of the possible registration of fatal cases under other names, such as Carbuncle and Erysipelas; but at any rate the fact is proved, that cases do frequently occur. Dr. Tanner says it is generally fatal within eight days of attack. I have not found any detailed history of any case in which recovery has taken place. Sir James Paget incidentally mentions one only, but does not give details.

It is stated on good statistical authority, that the mortality from Carbuncle, Phlegmon, and Boils, (diseases which probably belong to the same class,) is increasing. The Registrar General for Scotland draws attention to the fact, and also infers that the increase of the mortality from these diseases is connected with the importation of foreign cattle; and he suggests diseased meat as a cause for the malady. [Since reading the paper I have found that the subject is discussed in Holmes' System of Surgery, by Mr. T. Smith. He is of opinion that facial Carbuncle exists as a disease, with a strong tendency to a fatal termination, as distinct from Malignant Pustule. The case described by him appears to me to be a case of Malignant Pustule, but the writer refers to the absence of severe pain as diagnostic

of the disease, and dissents from Dr. Budd's view, believing that pain, the presence of pus, and the character of the swelling, will determine whether the case is carbuncle or pustule. It is however to be borne in mind, that pain is easily borne by one person, whilst a corresponding state is described as agony by another.]

Such is a short outline of the information I have gleaned regarding the disease. I will now detail my own experience.

The First Case I ever saw came under my notice in St. Thomas's Hospital, in the year 1851. I shall never forget the monstrous appearance of the patient; the enormously swollen lips, the livid, motionless, expressionless mouth, apparently wide open, but the teeth at the same time nearly closed; the swollen parotids; the large size of the head from the erysipelatoid inflammation which had spread all over it; whilst the man (æ. 36) retained his consciousness up to a few hours preceding his death, which happened six days after his admission into the hospital.

The Second Case came under my own care in May, 1854. W. R. (æ. 44) a grocer, noticed a spot on his lower lip, which itched a good deal; two days afterwards it was swollen, hard, stiff, and tender. When I saw him May 28th, he was feverish and depressed, and had lost his appetite: on the 29th he had a slight rigor: on the 31st the lip was excessively swollen, hot, hard, livid. On June 1st the lividity had spread to the upper lip; the lips were wide apart. Next day the cheeks were much swollen; and on the 3rd there was extension of erysipelatoid swelling to surface over the parotid and submaxillary glands, with slight sanious discharge from the lips of a foetid character, and the power of speech was lost. The lips looked like a hard, livid, brawny ring. On the 4th the eyes were closed, and the power to swallow gone, but consciousness was still perfect. He died on June 5th, the face the day before his death looking much like the perinœum of a fat woman during confinement, with varicose veins about the pudendum in hard labour, and just as the head of the child is about to pass from the vulva.

The Third Case was that of a handsome girl (æ. 22), tall, well-favored. She consulted me about a swollen lip, Nov. 6th,

1855. It itched very much, and she thought she must have poisoned it with some lip salve. The lower lip was like a commencing carbuncle, hard and brawny, and upon it there was a small vesicle. There was a minute quantity of ichorous discharge from it. On the 8th the eyes closed from œdema; on the 9th the power of speech was lost, and she died on the evening of the 10th, eight days after the first sign of the disease appeared, and four days after treatment commenced. The hard, brawny, wide-open, expressionless, motionless lips, which were almost black, rendering painfully hideous a beautiful and highly popular girl.

The Fourth Case occurred in the practice of my friend, Mr. Whitling, in November, 1862, in the person of a young lady from the West Indies, who had been placed by her parents at a first-class ladies' school at Croydon, about a year before her illness. She had the characteristic swelling of the lip, with continuous itching, on Nov. 14th. The swelling alarmed the mistress on the 17th, and my friend prescribed for her. On the 18th I saw her with Mr. Whitling: the disease was then marked and unmistakable. She was unable to swallow on the 19th, and she died on the 20th—six days after the itching first began to trouble her. The whole face was livid, and almost as black as that of a negro, having extra thick lips: she had no discharge from their surfaces; and she appeared to retain her consciousness until the last.

The Fifth Case is one to which I will more directly draw your attention, for it reached a stage which the others did not attain to. A lady, M. T. (æt. 36), born in India, educated in England, returned to the East; married, and came home four years ago to educate her family of eight children, and recruit her own health, which had been lowered by menorrhagia. She was however quite well at the beginning of the year. Late in the month of January she had a catarrh, and on Feb. 4th, her lower lip became stiff and uncomfortable, with a troublesome itching; swelling more on the 5th, and on the 6th I saw her. The lip was then enlarged to double the natural size; it was red and hot; it felt hard, brawny; there was a dark herpetic-like spot on the labial surface. It had the appearance of, and felt like, a carbuncle; it was restricted

to the lower lip and included the whole of it. She had not had any rigor, but felt restless and uncomfortable. On the following day there was an increase in the swelling; the lip had also become livid, whilst the constitutional disturbance pointed to something more than herpes. The brawny feeling, the livid patch upon the lip, itching much, yet without that acute pain which usually attends upon carbuncle about the face, were peculiarities which gave rise to a suspicion in my mind of Malignant Pustule. There was a slight erysipelatoid blush extending from the left angle of the mouth towards the ear. I at once commenced the treatment with ammonia in the manner detailed hereafter.

On Feb. 8th, the nature of the case was decided: a livid blush extended from the angle of the mouth towards the angle of the left lower jaw, the lip was monstrous in appearance, but scarcely painful; there was a slight blister, and a slightly disagreeable odour. The pulse 100, small and threadlike; a character it maintained continuously for nearly a month. The tongue was white and creamy. She had slept badly, but had fed fairly well. She had passed a restless, almost sleepless night, but not because of pain. The swelling extended into the left cheek, affecting the tissues about the parotid and sub-maxillary glands; the dusky red hue was more diffused than on the preceding day. The lower lip was larger, the left third of the upper lip had become implicated, the swelling ending with a fairly defined border, such as is sometimes seen when hæmorrhage has occurred beneath the skin from a blow on a hard or bony surface. The inner surface of the lower lip and the buccal lining of the cheek showed a kind of diphtheritic exudation, a little of which I scratched away with a director. This exposed a number of pits and sharply-defined honeycomb-like edges; some of these bled a little. The stiffness and sense of weight caused more discomfort than the pain, which was comparatively slight. Pulse 116, heart sounds and breath sounds were natural, tongue much coated, and could scarcely be protruded. The temperature ranged between $100\frac{1}{2}$ and $101\frac{1}{3}$.

The night of the 9th was a bad one notwithstanding xxv grs. of chloral, and on the morning of the 10th she appeared to be suffering from soreness, with carbuncle implicating most of the mouth, without any discharging surface outside the lips; whilst an erysipelatoid blush covered the chin and the left sub-

maxillary region. There was a difficulty in speaking, and some pain in attempting to swallow. On Feb. 11th, both speaking and swallowing were more difficult, the left eyelids were adematous; a few small blisters had formed on the upper lip, giving out a slight fibrinous discharge, whilst there was much coagulable exudation from the buccal membrane: this was felt to be much indented, but smooth. The cheek was nearly 5 inches thick, but she did not feel much local pain. Pulse 120. Temp. $101\frac{1}{2}$ to $102\frac{1}{4}$.

Feb. 12th, the swelling and erysipelatous blush extended over the larynx and down the side of the neck. There had been much discharge from the buccal membrane during the night. The lower lip was less swollen, not so hard, and the honey-comb depressions on the inner side were gone. The tongue could not be put out, or the mouth opened. Pulse 120. Temp. $102\frac{1}{2}$. That night she had more sleep in consequence of a good dose (xxx grs.) of chloral; the lower lip had decreased, but the upper lip was larger with exzema-like spots upon it. The parotid was more swollen and the face generally more livid. The whole of the anterior part of the cheek, from the angle of the mouth, seemed to be infiltrated with pus, and baggy parts could be felt between the mouth and the ear; but the discharges when examined under the microscope did not show any true pus cells; granular matter only being seen. She was quite unable to speak, but perfectly sensible, and wrote her answers to my questions on a slate. She was almost afraid to swallow, from the pain it caused, though she was without much pain if quiet. The two following days were very distressing, from her total inability to swallow. Attempts were made to feed her through a tube, not very successfully. From the fear I had of producing hæmorrhage I did not persevere. Enemata of beef tea were frequently given and retained, and also eggs beaten up with brandy and gruel. The redness and hardness extended in area down the neck, over the larynx and over the clavicle, but the mouth and lips became softer, and with that softness, the deceptive feeling of purulent infiltration increased. The eyes were quite closed, and the lips wide apart. On the night of the 14th she slept, and on the 15th she could swallow with less distress, and could say a word or two. The respiration was easy and natural, but she could not draw a deep inspiration by reason of the sense of weight she felt across the chest, if she used her

muscles beyond a certain point. A large quantity of fibrinous exudation was syringed out of the mouth; weak solution of Carbolic Acid and also Condy's Fluid being freely used. The intelligence continued perfect. Pulse 108. Temp. $101\frac{1}{2}$.

From this date, the swelling about the mouth gradually decreased, soft abscess-like lines, or lines with a suppurating kind of feeling could be made out along the ramus of the jaw, marking the position of the submental vein. Several elevated lines were felt as cords across the larynx, (not soft but cord-like,) others occupied the upper part of the sternum; another set radiated over the clavicle, and others on to the left pectoral muscle. On the 17th she opened her eyes, and smiled at her attempts to drink from a tea cup. On Feb. 18th there was some extension of the swelling to the nose, producing a snuffling kind of breathing, but it lasted two days only. The appearance of the face was now mottled and tuberculated, as if she was the subject of acute rosacea with erysipelas, plus inflammation of the parotid. The soft baggy places beneath the chin had now given place to hard tuberculated lines running along the ramus of the jaw to the left ear; one or two small soft places still existing. Cords could still be felt over the larynx, as well as on the pectoral muscle; they were dusky red and slightly tender. Several pimples were about the face, scarcely to be called pustules. One of them gave out a quantity of pus-like stuff, which did not however shew signs of pus cells under the microscope, but consisted of granular matter only; deglutition did not cause pain; the œdema under eyelids was also gone. Pulse 109. Temp. 102.

On Feb. 19th the temperature was higher, $102\frac{3}{4}$, and the pulse was 120, still thread-like; the number of inspirations in a given time were also greater. The hard cord-like lines had extended in area. The right parotid was much swollen, and a congested state of conjunctiva pointed to some block in conjunctival vein. Several phlyctenoid vesicles as if pustular made their appearance, but their contents were not pus cells, but granular matter only. The urine continued natural—sp. gr. 1.015. Next day the temperature fell again to 101 in the morning, and $101\frac{3}{4}$ in the evening. The pulse was 108, and the number of respirations per minute 26.

The next day, Feb. 22nd, the temperature was $101\frac{1}{2}$ morning and mid-day, $101\frac{1}{4}$ in the evening; a free fibrinous discharge took place from vesicle under the chin, which coagulated

immediately; the dusky colour was all gone from the face, except on the cords previously alluded to. The urine had risen in sp. gr. to 1.025, and shewed much colouring matter on the addition of nitric acid, but no albumen. There was a slight tenderness over the liver, the bowels were confined, but appetite better, that is, she had less dislike to take food.

Feb. 23rd, the phlyctenoid vesicles were gone, as well as the tuberculated appearance of the cheek, though the puffy spots were still there, as if slight deposits of infiltrated pus remained. The veins over the larynx and sternum were not so cord-like; no pain on swallowing, no weight across the chest, eyes bright, respiration nearly natural, but the face is sallow. The position of the submaxillary vein is shewn by an irregular mark a quarter of an inch in diameter. She has a slight cough, but no physical signs of disease in the chest could be discovered with stethoscope; she is still tender across the hepatic region, but without physical sign of disease there. Pulse 104. Temp. 100.

Feb 24th, is free from pain, but is low spirited, and, as she says, "liverish." She remained in this state for two or three days, feeling as if her neck was tied down by cords. The external jugular could be felt as a hard cord along its whole length, and the movements of her head upon her chest much impeded. The pulse fell to 100, and the temp. to $99\frac{1}{2}$ in the morning, rising to $100\frac{1}{2}$ at night, and without hepatic tenderness.

On Feb. 26th she sat up in bed and cleaned her teeth, the pulse lost its thread-like quality, and the skin became moist for the first time since her illness began. She was on the sofa on March 1st, with a good appetite, a cleaning tongue, no colouring matter in the water; the urine having become natural. On the 4th the ammonia treatment was omitted, and quinine with nitric acid given. On the 5th she walked across the room to the sofa. Soon after walking she had a pain in her left ankle, which rapidly became swollen, puffy, and tender. It became worse during the night; on the 6th it was much enlarged, and acutely painful if allowed to hang down for a minute. A gentle pressure removed the tenderness and diminished the swelling: the latter had the distinctive feeling one meets with in diffuse cellular inflammation, rather than in that of simple œdema. On March 9th it was gone, but the posterior tibial region remained tender: the swelling again took place if the leg was allowed to hang down. She had a momentarily sharp pain in the knee,

but no evil followed then. She had a troublesome little cough, without pain, and without giving rise to any sign of mischief capable of being revealed by the stethoscope; but there was a little tenderness over the liver, and an inability to draw a deep inspiration, from a feeling of tightness across the front of the chest. The cord-like feeling of the external jugular was less marked, and much of the parotid and buccal swelling was gone. The puffy pus-like feeling under the jaw was gone also, but red marks on the skin still shewed the position of the veins. Her spirits were good; she expressed herself as feeling better; appetite improving. Pulse 96—respiration 22. Temp. $100\frac{1}{4}$.

On March 12th she changed—became irritable, restless, and depressed; had continued headache, loss of appetite, and pain across the chest; the latter she said was caused by the acid medicine. Next day there was a puffy swelling on the right sterno-clavicular articulation, with tenderness on right side of neck, and along the clavicle. Gentle pressure got rid for the moment of pain and swelling. Temp. 99.7. Pulse 108. Urine natural in quantity but micturation very frequent, sp. gr. 1.008, slightly acid without either albumen or colouring matter. The night was bad, and on March 14th there was acute pain in clavicular region; every movement of arm producing agony. The upper lip was scarlet, and livid lines pointed out the position of the plugged veins. Pulse 112. Temp. 100. Micturation repeated every hour. The pain in shoulder continued very severe for a day or two; she laid on her back in bed, with her knees drawn up, feeling more comfortable in that position; and on March 16th the pulse was 120, and thready. Temp. 101. at 9 a.m., $101\frac{3}{4}$ merid. 102 vesp., skin dry, urine very frequent, sp. gr. 1.010, slightly acid, without albumen, but containing bile pigment. That night she had a free perspiration, and on the 17th the pain and swelling in shoulder was decidedly less. She passed 4 pints of water in 24 hours at 12 evacuations, slightly acid, with a few large granular corpuscles, but no albumen; and on the 19th a few blood corpuscles.

March 20th there was a slight feeling of chilliness scarcely amounting to rigor, the pain and swelling extended to 2nd and 3rd costal cartilages, the knees continued to be drawn up, but not (she said) because there is pain when they are straightened, but because she is easier; countenance became sallow; conjunctiva tinged; water troublesome, but less frequent, higher

coloured with about $\frac{1}{8}$ albumen and contained much bile pigment; is now neutral, sp. gr. 1.011. The neutrality did not continue, for next day it was slightly acid, and without albumen, but it presented a deposit which the microscope shewed to be granular exudation corpuscles, but no casts could be found.

On March 23rd she revived, and had lost much of the acute pain in the costal cartilages, except when pressure was used: she did not complain of pain when pressure was made over either liver or kidneys, whilst no swelling could be detected in either organ. This revival was transient, for on the 24th she had a rigor, which was followed by an attack of spinal convulsion lasting 20 minutes; but it did not produce unconsciousness. This was followed by severe pain in the abdomen, and when visited two hours afterwards, the epigastric vein on right side could be felt along its whole course as a thick cord, whilst several branches could be felt through the now thinner abdominal walls as if the mesenteric veins were plugged. The heart's sounds were weak, pulse 115, small and feeble. For a short time she appeared to be dying. The ammonia was immediately resumed in small doses every few minutes, then every half hour, and, as soon as she revived, at longer intervals. The urine passed in the morning before the fit, had a sp. gr. of 1.008, no albumen, slightly acid, but a slight quantity of colouring matter still there.

[Such was her condition when the paper was read: the rest of the history of her case has been written subsequently.]

At 11 p.m. the pain was relieved, the pulse had recovered its power, 116, the convulsions had not returned, and she expressed herself as very much better. The knees were drawn up, but pressure could be easily borne on the abdomen. Immediately she began to take the ammonia again she felt relieved, and began to revive; she had a fairly good night, and on the 25th continued to improve. On the 26th the pain in the illiac region was considerable. Pulse 110. Temp. $100\frac{1}{2}$. But from that time all unfavourable points decreased, dangerous symptoms never returned, and she continued day by day to recover her power. The colouring matter disappeared from the urine; the white alvine evacuations which made their appearance after the convulsion, gave way to properly coloured ones. The cords in the abdominal region departed very slowly, and on April 21st the positive signs of disease were all gone. Pulse 86, tongue

clean, bowels regular, no pain on pressure over the liver, no hardness or enlargement of any kind. Micturation rather frequent, but chemical condition of urine about right, and on May 2nd she was on the sofa. This attempt at movement was again followed by a relapse; pulse became frequent and appetite bad, with recurrence of pain in right sterno-clavicular articulation. There had been a little swelling remaining at this point, but it was not severe until after she had exerted herself a little. The constitutional disturbance did not continue more than a day or two, but the swelling increased, giving rise to a tumour about the size and shape of half a small orange. It was hard and tender, with a blush of redness as if suppuration had commenced. In a few days it decreased in elevation but extended in area, so as to take in the 3rd costal cartilage, and about the 20th of May the greater amount of swelling was over the 3rd costal cartilage, whilst the sterno-clavicular articulation was freed. At this time, also, a small node appeared on the tibia, about the middle third of each leg, which became painful on movement and pressure, but otherwise did not disturb her. Notwithstanding these, her general health continued to improve; she gained power, flesh, and spirits. The liver kept free from evil, its functions being properly performed, and the ordinary examination did not discover anything amiss with the kidneys. About the middle of June she was able to get down stairs, and although movement caused pain in the nodes on her tibia, her general health continued to improve day by day, and at the end of the month I sent her to the seaside. She took a course of tepid sea water baths. Her mother wrote to me on July 10th, to the effect that "she returned from her bath quite hungry, and found the place on her neck, which had looked rather queer for a day or two, had broken whilst she was in the bath. To-day" she says "the discharge still continues, but is very slight, and appears to be only water. Her ankle is still swollen, but she gets out twice a day, and is daily getting strength." She returned home a fortnight afterwards stronger in every way, with a small opening between the 3rd rib and its attachment to the sternum, but swelling and tenderness was all gone; a drop of serum exuded occasionally. A few weeks afterwards the nodes on the legs discharged a little serum in the same manner, and until this took place there was always a little œdema on the front of the tibia after walking.

Ultimately these all disappeared, and when I saw her about the end of Sept., she was perfectly well. The side of her face occasionally became swollen, and it is at present perceptibly larger than is the unaffected side. I anticipate some result at some future time in this situation. The marks which indicate the position of the obstructed veins were still indistinctly visible.

The most important point in the consideration of this case is the result: she has recovered, whilst history says they all die. On looking back, in explanation of the treatment pursued, I may remark, that I determined to give free ammonia for two reasons. First, that the course pursued in one or two of the cases I had previously watched, seemed to follow the course which is said to supervene in certain forms of snake-bite; and, secondly, the wonderful success which has attended its use in numerous cases of embolism, and some of which have been brought to the notice of the profession by Dr. W. B. Richardson, and which success has been as perfectly marked in several cases under my own care, when the patients seemed literally snatched from the jaws of death.

On the 2nd day of the patient's illness, I gave her v. drops of strong solution of ammonia in water every hour. It was continued without intermission until the facial swelling had greatly decreased. I then gave it every two hours. She took that dose continuously for 28 days. I gave it the credit of arresting the tendency to gangrene, stopping threatened suppuration, and consequent purulent infiltration, at the same time that embolism in the ordinary acceptation of the term was prevented, the softening clot of which probably induces true pyæmia. If this theory of its effect is a correct one, it probably comes about by ammonia stopping the retrocedent developement of disintegrating clot in the venous system, as the circulation becomes restored; and preventing the growth of that form of germ which raises the heat of the blood to the point which is necessary to arise for its fructification and reproduction, without which the disease cannot continue. Or it may prevent the growth of that form of germ which I believe to exist in this class of cases, and which germ by its growth raises the heat of the part to that point which is inconsistent with the life of the blood itself.

The ammonia was omitted on March 4th, but the sudden formation of plug in the neighbourhood of the ankle joint, indicated that the mischief was scotched, not killed. The

ammonia was resumed on the 7th, and continued with small doses of iodide of potassium for a few days, until a new danger appeared, viz., a continued desire to micturate; which was rapidly followed by a neutral state of urine. I then omitted the use of the ammonia, and gave small doses of nitric acid, which appeared to restore the acidity of the secretion, and reduced the irritation of the urinary passages. The appearance of albumen in the water, and with it large compound granule cells without retaining walls, pointed most forcibly to the production of mischief in the kidney, which I considered to have been set up by a commencing embolism. The abundance of colouring matter having a purplish green reaction on the addition of nitric acid, shewed most clearly that the liver was also the seat of venous obstruction. She soon complained that the nitric acid caused much pain in the stomach, and wished it changed. Its use certainly was always followed by apparent relapse. I then gave her small doses of carbolic acid in solution with gr. vi. of chloral every four hours. This plan allayed the pain, gave her refreshing sleep, and appeared to promote the return to absolute health. It was omitted a day or two before the relapse occurred on March 24th. On that day the ammonia was resumed again at short intervals and continued for about a week, when it was finally given up altogether. She expressed the greatest comfort from the ammonia, and always said that the acids disagreed with her.

When I first saw the case, I thought that if a sharp knife had been used to slice away the whole of the hardened lip, the evil would have been at once removed. When the deceptive feeling of suppuration was present under the ramus of the jaw, I felt very much inclined to incise it freely, but at this stage I had the advantage of Dr. Bristowe's counsel, and he agreed with me that it would be an unwise proceeding; that surgical interference was then inadmissible, and would be useless to effect any good object. The temptation to use the knife was strong, but I had an abstract idea that the chance of true pyæmia would be much increased by an external wound; that the contact of air with a suppurating surface extending into cellular tissue, would be adding to the patient's danger. I therefore steadily put away the thought of incisions, continuing the local application of carbolic acid, and washing the mouth out frequently with Condy's fluid. The effusion which had taken

place did not reach the purulent stage, as far as microscopical examination told us; and there was no appearance of pus cell until the embolism occurred in the kidney, and then the large compound granule cells which appeared were not true pus but changed epithelial cells.

I am inclined to adopt the belief that there is some intimate connection, as cause and effect, between germs or cacozymes floating in an impure atmosphere, and the production of the pus cell; but it is almost impossible for it to be other than a belief, as so many circumstances may interfere to prevent indisputable proof. The germs consisting of certain organic impurities, such as imperfectly used up material from continuing life, may then become portions of the ordinary excretion from the body. If these germs did not obtain admission so as to affect the fluids of the body and multiply themselves at the expense of the fluids, the patient's chance of life would be increased. The result in this case seemed to justify the idea, though it is possible that the original quantity of carbon-poison might have been excessively small, and require a longer time for its reproduction, before it was able to set up evil sufficiently active to ensure suppuration. This longer time was not given to it, the ammonia preventing its further increase, and staying its ravages in the blood itself.

There is another curious point in this case which I wish to bring to the notice of the Society. I examined the discharge which came from the buccal membrane, and also from the skin. I found it of the granular character which belongs to fibrinous matter. It did not contain any pus cell, not even in that which was scraped out of the pits which formed in the swollen lip, and which looked much like those which are found in aphthæ. That which I examined on Feb. 10th remained granular; but that which was taken on the 12th shewed a few minute rod-like bodies which rapidly developed into a fungus growth, and which form of fungus I do not find figured in any work upon microscopic fungi to which I have access. It appears to be one of the Hyphomycetous fungi, allied to Botrytis and Penicillium, though it may possibly belong to Ascomycetes, the terminal fructification in some cases appearing in asci. The peculiarity of the case is the fact, that I was only able to find this particular fungus in the discharge which came out of the patient on the 12th and

13th. Several slides were preserved on later dates, but no fungi appeared. Another peculiarity also was seen. Several acari developed in the discharge, which did not appear in any other except those taken on the 12th and 13th, being the days upon which the temperature was the highest, and the danger the greatest. As soon as the disease decreased in intensity, the organic life, (both animal and vegetable,) did not again put in any appearance in the discharges, or rather, no germs existed in the matter which could develop as did those coming from the patient on those days. I consider this production a curious point in the history of the case. It may be a coincidence merely—the germs having gained access to the discharge, but it is curious that they should appear only when the disease was at the highest, and when the greatest care was taken, by the use of carbolic acid and solutions containing Condly's Fluid, to destroy the effect of the discharge, and when the patient was all but unable to swallow. I removed the discharge from the vesicle to the slide, and with the same care on every occasion, placing the thin glass over the secretion immediately, but no similar organic life appeared in any of the discharges except on those two days; and if I had examined the blood microscopically on those days, I have no doubt in my own mind but that I should have found some parasitic life.

Bearing upon this point I may refer to the experiments of Summer, the Prosector of the Veterinary Institute at Dorpat, as related in Virchow's Archives. He found parasitic growths in the blood of patients dying of charbon. He injected penicillium glaucum into the veins of colts without effect. He then injected micrococci from the blood of an animal affected with charbon; the spores being put into distilled water, and a few drops forced into the jugular vein. Five days afterwards no symptoms came on; he then injected a larger quantity, and in ten days fever set in, and the animal died the same night. The autopsy shewed clearly that the injected parasites had produced a disease in the colt similar to that in the animal from which the parasites were taken. It is true that a fair objection may be urged to this experiment, viz.,—that something else might have been injected as well as the micrococci; but I think the coincidence is worthy of further research in connection with the developement of parasitic growth in this case; but whether as cause or as consequence I have not sufficient evidence to shew.

Another point worthy of consideration is the absence of any evidence of tangible infection. None of the cases that have come under my notice, had had any personal communication with diseased animals. The subjects were the most unlikely persons to come into contact with any such. The actual causation of the disease is a mystery; unless the suggestion of the Scotch Registrar General is a key. Even then, it is curious that the cases should be so few, because Dr. Letheby's evidence abundantly proves that diseased meat is largely consumed as food. The human stomach can resist the action of the cobra poison, and it may fairly be assumed that it is able to resist the influence of a moderate dose of diseased meat. Dr. Livingstone, however, relates that the flesh of diseased animals in South Africa when eaten as food, was found to produce malignant carbuncle; and he says there was abundant evidence to connect them as cause and effect. It may be that milk from diseased cows could produce it: I have no evidence to prove it. But it does appear in these cases that the disease commenced on or in the substance of the lips, and was not directly produced in the manner set forth in the nomenclature of the Royal College of Physicians; and several of the cases reported upon by Dr. Budd appear to have had a corresponding doubtful origin: there is room therefore in this class of cases for further inquiry.

It appears to be undoubted that parasites such as bacteria and vibrios do exist in the blood of beasts dying of cattle plague and its allies; it is said by some that these are results only and not causes. This may be so, but the case I have related appears to me to show that there was a product in the patient's system capable of generating animal and vegetable life, but that ammonia prevented the developement, disallowed its growth, and by that means interfered with the conditions which make the cases ordinarily fatal.

May not the growth of parasitic life in the fluids of the body be itself a means of raising the temperature? Dr. Clifford Abbott has pointed out that "the vitality of the blood persists within very narrow limits of temperature, and that if the heat of the body be raised a few degrees only, the white corpuscles and the capillaries themselves lose their activity. There is an arrest of circulation in the internal tissues, and with that, an arrest of their work." On two days only, viz., when the

temperature of the patient was the highest, and when she appeared in the greatest jeopardy, parasitic life developed itself in the effused morbid products; the ammonia then asserted its power—prevented the coagulation of the blood from proceeding, arrested the further developement of parasitic germs, and saved the life of the patient: such is my theory.

It is known that the developement of certain fungi is accompanied by an elevation of temperature. In a few cases it has been seen that the number of parasites in the blood of animals dying of cattle plague is immense, if the blood is examined immediately. This enormous product must be attended with an extra developement of heat in the part affected, and I would ask if this heat is not sufficient to raise the natural heat to a point which deprives the capillaries of vitality, and sets up the condition which ends in so called gangrene.

The effect of nitric acid appeared to be to recall to life particles not yet dead. It probably did this by removing the ammonia from the blood and allowing the growth of germs not completely destroyed. These appeared to be the cause of the secondary swellings which took place in the neck and legs, but even here suppuration was not established, notwithstanding the presence of some morbid product, for the discharge was serous, not purulent. I was sorry that I could not secure the discharges from those formations, as it is possible that a proper application of heat and other re-agents might have developed a fungus similar to that which I obtained from the discharges which took place at the greatest height of the disease.

I publish these suggestions and observations for what they are worth, hoping that some able men will follow the ray of light which seems to be breaking in upon the causation of this class of disease.

(2. cont.)

ACUTE FARCY OR GLANDERS

IN THE HUMAN SUBJECT.

THE disease called GLANDERS, common enough in the horse, is rare in man; and when it occurs is generally fatal. Rayer (says Dr. Tanner) reports upon fifteen cases, of which fourteen ended fatally. The following case is re-published in connection with Malignant Pustule, because I believe there is an alliance between the diseases. They evidently belong to the same family. The frequent termination of such cases in death, renders this case a peculiar one, for the patient perfectly recovered. It was published in the Medical Times and Gazette, Aug. 4, 1855, sometime after it had been reported. I was in temporary charge, as resident Medical Officer, at St. Thomas's Hospital, in the summer of 1851, when my attention was forcibly directed to a case of Glanders in the human subject, which was then in King's Ward, under the care of Dr. Barker, which is also published in the Medical Times and Gazette. That case passed through the various phases peculiar to Glanders, and ended fatally. Some months after that, I was assisting my father, a medical practitioner in an agricultural district, when E. B. came under my care, and I saw him from the onset. There are many points of resemblance to Malignant Pustule, but also marked differences; but happening so many years ago, I am now inclined to refer the result more to the ammonia than to the mercurial treatment, to which the good result was at the time referred, and I should certainly decline to give mercury again in a similar case.

Mr. J. Gamgee says the prognosis is most unfavourable, and that acute Glanders, when accompanied by the characteristic eruption, is almost necessarily fatal, but that unaccompanied by the eruption, it is more favourable: in this case the eruption did appear. Comments on it at this long time since, would be

imperfect, as I might misinterpret the symptoms. It may not be out of place to remark, that one of the earliest recorded cases of Glanders in the human subject, was that of Mr. Turner, a veterinary student of Croydon, which is fully related by Mr. Travers in his work upon Constitutional Irritation, published about 1820.

Ellis B., aged 48, a respectable grazier, states that about October 18th, 1850, he bought a horse at a country fair. In a subsequent quarrel with the horse-dealer he received a blow upon the upper lip, causing a small lacerated wound. A few days afterwards the lip became painful, and began to swell; this was soon followed by pains in the legs and arms. He obtained some medicine from a druggist, but afterwards becoming alarmed, sent for his own surgeon. The writer happening to be in the country, saw the case on the 4th of September, and found the patient in a very deplorable state. The upper lip and right side of the face were very much swollen, the right eye nearly closed, the skin livid about the lip; the right half of which was a dark dry slough, with a good deal of dried purulent discharge about it. Surrounding this livid part was a lighter erythematous surface, extending up the side of the face and forehead. Beneath the slough there was some unhealthy-looking pus, and in the livid portion of the cheek were one or two furunculoid spots. The right elbow was swollen from the middle part of the fore-arm, to about three inches above the condyles of the humerus, very painful, and exceedingly tender; the skin had an erythematous blush, similar to that of the face, much darker in the centre than at the circumference, where the redness was more vivid. There was a somewhat similar place on the front of the left leg, but much less extensive. He stated that he was subject to rheumatic fever, and believed that these swellings were from that cause. But it was evident that they were something more. He thought that they might be from bruises received in his encounter with the horse-dealer, as, on being more closely questioned, he acknowledged that he had received blows about those parts. The constitutional symptoms were rather high, but the pulse was not hard. It was almost determined that he was suffering from an attack of erysipelas, when the cases related by Dr. Elliotson were remembered, and a sus-

picion raised that it might be from the effects of the poison of Glanders; and on inquiry it was ascertained that the horse he had bought was actually glandered. This knowledge was obtained from the patient's friends, and not from the man himself, who had no ideas of this nature. The treatment was at first directed to abate the febrile symptoms; a poultice was applied to the lip, warm fomentations to the arm and leg, and some simple saline medicine given frequently. On visiting him on the following day, the swelling, redness, and pain were found to be less severe. The slough had separated, and left a deep, unhealthy-looking ulcer with excavated edges; the nose and salivary glands were minutely examined, and were found free from disease; there were no spots or pustules upon any part of the body, except that mentioned on the cheek.

On September 6th the redness and swelling had still further decreased, as well as the tenderness. The appearance of the elbow was much altered. The swelling had become quite prominent, and more circumscribed, principally seated over the supinator muscles, below the bend of the elbow; it was much softer. He complained of severe aching pains in all his limbs, and still believed that he was suffering from rheumatic fever. The pulse was soft, 90; tongue loaded with a white fur, scarcely any appetite and some little thirst; no rigors. The excavated ulcer on the lip seemed a little larger; but the swelling about the forehead and right eye, as well as the erythematous redness, were nearly gone. The discharge from the sore was profuse, dirty, and very offensive; the front of the leg very painful, but less swollen, and not so circumscribed as that of the arm. On September 8th the swelling on the forearm presented the characters of a circumscribed abscess. The redness was gone, except in the centre of the swelling, where pus seemed to be presenting. A lancet was introduced, and about six ounces and a half of ill-formed offensive pus evacuated. The pain had been very acute, but was at once relieved by the operation. The leg continued in the same state. The ulcer in the lip was not extending, but the edges continued excavated, the discharge sanious and offensive. The swelling and redness were quite gone. The aching pains in the limbs were severe, and prevented his sleeping at night. The tongue had a yellowish moist coat; the appetite was a little better, and there was less thirst; pulse 90, rather weak. But altogether he expressed

himself as being better. The bowels being rather confined, he was ordered an aperient, as well as the following medicine:—
 ℞ Pil. hydr. gr. viii., opii gr. i. in pil. ii., omni nocte sumend.
 He was also allowed a little better diet, such as strong beef-tea, etc.

September 10th.—He appeared in much the same state; perhaps less discharge from the lip. There was also fluctuation in the front of the left leg: about an ounce and a-half of pus, somewhat similar to the former, was let out, and poultices applied afterwards. The poultice to the lip was discontinued, and some of the following ointment put in the ulcer, and over it some charpie. ℞ Ung. hydr. fort. ℥i., ung. simp. ℥i. M. Ft. ung. He slept better after taking the pills.

On the 13th, more decided symptoms of debility appeared. He felt languid and faint; pulse 86, very weak. Tongue cleaner; skin moist; appetite improving; scarcely any thirst, except in the night. Some red granulations could now be seen at the bottom of the ulcer, which seemed to be filling up; it was also less excavated; and the discharge although profuse was not so offensive. The abscesses discharged freely, and were now quite easy; but he had tender lumps in the calves of both legs, which interfered with his position in bed. The pains in his limbs were not so severe. There was also some cough, and a little tenderness beneath the left pectoral muscle, but no lump could be detected, nor physical signs of chest-complications. He was ordered some mixture containing carbonate of ammonia and cinchona every four hours; to eat a mutton chop or two daily, and to take a little port-wine and porter.

On the following day he seemed worse, having become much alarmed on account of being told that he had the Glanders. He became restless, more anxious, and with more severe pains in the limbs; but his pulse continued weak, 88. Tongue a little cleaner. The appearance of the lip had improved, healthy granulations springing up on the inner side, although another small slough had formed and separated on the outer side. The nose and salivary glands continued quite free from disease. The cough had increased, but there were no abnormal physical signs. He felt better after a large dose of wine had been given, and he had been assured that there was no immediate danger. Not having slept so comfortably, the quantity of opium was increased to gr. jss. o. n.

During the next few days he seemed to improve, the abscesses and lip continued to discharge, but the amount gradually decreased. The swelling in the calf of the right leg increased in size, became very tender, and at length an erythematous blush appeared over it. The sloughing appearance of the lip departed, and it became a healthy ulcer, with healthy purulent discharge; at the same time he began to complain of his mouth being a little tender, and his breath to have a mercurial fœtor, and also of darting pains in the back of his head, and the nape of his neck, with now and then a slight rigor. The cough varied very much; at one time severe, with a stringy, frothy expectoration, when physical signs of sub-acute bronchitis could be heard; at others, slight and dry. The appetite, state of the pulse, and appearance were much the same. On September 16th, the eyes became affected—the lids gumming up, and in a day or two discharged some purulent stuff. They, however, recovered themselves after the repeated application of warm fomentations, and a slight astringent lotion. Occasionally a tender spot would form, feeling like a little hard lump; in a day or two it would quite depart, and one or two others would appear in another part of the body. On September 19th, the abscess which had formed in the calf of the right leg was opened, and about ʒss. of pus let out. About this time also the cough became exceedingly troublesome, with profuse stringy expectoration, not at all gummy or rusty: he received benefit from the repeated application of mustard-cataplasms to the chest. The lip had now nearly healed, and the furunculoid spots on the cheek had disappeared. The abscesses which had been opened first scarcely discharged anything, and the pains in the limbs were much easier. The gums becoming rather too spongy, the mercury was omitted, the opium alone being taken at bed-time, but the application of the blue ointment was continued a little longer; it was not left off until September 25th, when the lip had quite healed, and the gums had recovered themselves. He now began to get very feverish towards evening, and to have a more decided attack of rigors, occasionally followed by profuse sweating, but the tongue kept clean, and the appetite good; being able to eat two or three chops daily, and take half a pint of port-wine, with a little brandy, and some porter. But his weakness increased so much that he could not raise himself upright in bed. Another abscess also

developed itself in the calf of the right leg. It was opened, and a small quantity of pus let out; the cough and expectoration had much decreased; the pulse continued weak, about 96. He was now ordered—Acid. sulph. dil. \mathfrak{m} xv., ferri sulph. gr. i., tinct. opii \mathfrak{m} v., infus. gent. co. ad \mathfrak{z} iss., 4tis horis.

This medicine rather checked his profuse perspirations. On September 28th, he had a much more severe attack of rigors, and in a day or two several red elevations made their appearance about the body. The circulation seemed at times to become impeded in the extremities, and once or twice the left hand became cold and livid, and then black, looking as if gangrene had commenced, but after the application of warmth, the swelling, coldness, and dark colour departed. The elevations were dark red in colour, exceedingly tender, and felt hard. The number upon the forehead, scalp, and sides of the face were very great: they were also numerous on the upper extremities, but not many on the body or lower extremities. About Oct. 4th, the number was the largest; and then there seemed to be two kinds, one darker, another set lighter, and like minute spots of erythema nodosum. Upon a few of the darker ones now appeared a small pustule, of the kind which Willan calls phlyzaceous. The pains in the limbs and about the joints became exceedingly severe; the latter at times were swollen and tender to touch. Such was his state on Oct. 4th, when he was so weak that he could scarcely raise his hand to his head; he had an exacerbation of the fever every evening; had a weak pulse, 100, and a very capricious appetite, so that it was necessary to ring the changes upon different articles of food: wine, ale, brandy, or porter being given as his fancy dictated. The iron and acid medicine was now omitted, and full doses of citric acid given.

After this had been taken for a few days the spots began to disappear, and the pustules to die off, while the heat of the skin and profuse sweating decreased. About Oct. 12th, the nose began to be tender, and require frequent blowing. The cough had nearly ceased, and the aching pains in the limbs were much less. On the two following days there was some slight bleeding from the nose, and, on the 16th, a discharge of thick, slimy, yellowish, semi-opaque mucus commenced, which, in the course of a day or two, became profuse. As soon as the spots began to decline he began to recover his strength and

appetite; the abscesses had quite healed, and the tender lumps seemed to melt away. The bowels, which had been rather confined all through his illness, now frequently became relaxed, but not to any great extent. His acid mixture was changed for quinine and astringents, whilst a solution of nitrate of silver (gr. i. ad. ʒi.) was frequently injected into his nose, with decided benefit. On the 24th of Oct. the eyes again became affected, and were treated in a similar manner, with success, although they remained weak, and discharged a little purulent-looking stuff for a long time. The discharge from the nose continued until the end of October, when it gradually ceased. The spots had then all disappeared; the sweating continued, but less profusely; he still had a good deal of pain in the limbs, but his strength was very much greater. He now began to sit up a little; and, after a few days, was able to get down stairs. The symptoms of depression gradually ceased. The hectic state departed; the pulse improved in strength and volume; and, on Dec. 1st, although he had not quite recovered his former robust health, was in a very fair way of losing all traces of the disease.

The Medical Times and Gazette remarks that "the favourable result of this case will be a good recommendation to the employment of mercurials, followed by antiscorbutics." The citric acid was given with the idea that it might combat the evidently diseased state of the blood; whether the result was an effect, or merely a coincidence, it is impossible to say; but I am inclined now to think the continued exhibition of the ammonia was the reason why the parasitic life was overcome, and the patient rescued.

(3.)
CASES OF

MUSCULAR ANÆSTHESIA ?

READ NOV. 13, 1871.

THE Cases I am submitting this evening for the consideration of the Society, consist of two sisters, aged 29 and 27 respectively. They have been under my observation for nearly three years, and present some features in common, which appear to me unusual in character, and worthy of the consideration of the Fellows of this Society. They are the daughters of a City gentleman, himself and his family are of irreproachable character, and the young ladies themselves of considerable intellectual attainments, whilst a younger brother has been first in a well-known public school, and is now distinguishing himself at one of the universities. I have the consent of the parents for their appearance here this evening, in the belief that so unusual a combination of symptoms, must be of much interest to physiologists, and may ultimately be of service in elucidating a very intricate point in pathology. Whilst the ladies themselves have had the moral courage to come, on the possible chance that benefit may result to themselves, from the suggestions that may arise in debate, as to the best course to be followed in their future treatment, they understand that their names will not be published, and that they will not be submitted to any uncomfortable examination.

The eldest sister, M.H., is aged 29, of an average good condition of general health, though she is now considerably thinner than she was a year ago; her muscles are not so firm and well nourished as they were; her thick lips and prominent eyeballs are indicative of some want of structural power. Sitting in her chair she has the aspect of moderate health; which is the case as far as the act of living is concerned, every function of organic life being properly performed, and there is no indication of any derangement of the natural functions of the body. During the

three years she has been under my care, she has had two or three attacks of catarrh or so-called feverish colds, and once or twice bilious derangements, which have affected her in the usual manner, and have not altered the condition which we are called upon to consider this evening. She cannot rise from her chair without assistance, and the attempt is clumsily and awkwardly performed. When she has gained the erect position she staggers somewhat, and is as if uncertain in her gait, having a movement which corresponds with that one sometimes sees in intoxicated persons. The foot is raised from the ground, there is then an uncertainty as to its position, and then it goes down with a bump, the heel coming down first with a forcible blow to the floor. She explains this action by stating that she does not know the position of the foot, as she cannot see it, and that she does not know how far it is from the ground, or how far she has to move it. She is unable to support herself in the upright position without assistance, though the knowledge that it is at hand helps her very much, and the real aid required is small. She advances with a kind of roll, and with much apparent effort, though she is sometimes able to walk some little distance. She has more difficulty in starting than in continuing her movements, when she has once attained the upright position, and is actually progressing. If she stands in the middle of a room, and is told to shut her eyes and then move, she is in danger of falling unless assistance be close to her. On further research it is seen that there is not any material loss of power in individual muscles, and that some force is required to bend her arm against her will, and that she is able to bear a considerable weight, as well as lift it from the ground, but she requires to see what she is doing. She cannot always walk with certainty in the dark or with the eyes closed, so that if standing in the middle of the room, and the light is suddenly extinguished, she would most likely fall to the floor. This faculty was attended on one occasion with most uncomfortable results, for whilst washing at her bath, her hair happened to fall forward over her face, and thus obscured her vision. She immediately fell forward, and striking her forehead on the edge of the bath, inflicted a severe scalp wound. She stated that her feet seemed to slip from beneath her directly her sight was obscured.

Her sight is good, the pupils act equally and freely, and the muscles of the eyeballs do not seem to have any defective

co-ordinating power ; there is no amblyopia ; and there is no want of association in the muscles of expression ; but there is a kind of precision in her method of speaking, as if an effort were required to associate the lingual movements. This is however comparatively slight. The want of co-ordination is not so marked in the upper extremities as in the lower, although there is considerable clumsiness of movement. She can thread a needle, and work needlework moderately well, provided the eyes are fixed upon the object ; but if they close the power is lost, and the mark is at once missed. She must keep the eyes intently fixed upon the work, or she cannot do it. She can button a button, or fix in a shirt stud, if she looks at it, but not otherwise ; therefore she cannot do anything of the kind out of sight. Yet she is able to execute drawings of considerable merit, and do very fine work of various kinds. She used to play very well upon the piano, but this became gradually more difficult, and for the last five years the requisite kind of movements have become unsteady and imperfect. Some of her recently executed drawings are on the table, as well as some of her writing—a part written in 1863, and a second, just recently. It will be observed that very little difference exists in the character of the writing itself, though an expert can easily mark the alterations. Her memory is good and her intellect rather beyond the average ; and her hearing is perfectly right. She never suffers from any pain which can be associated with her want of muscular steadiness. There are not any jerks or starts or muscular tremors indicative of excitomotor disturbance ; the urinary organs are intact—the urine since she has been under my care has always been normal in quantity and quality. There is a considerable lateral curvature of the spinal column, with some flattening of the ribs in the right side in the middle dorsal region, with corresponding protuberance of the ribs on the other side lower down. The distortion which is considerable posteriorly, does not produce much alteration in the shape of the ribs in front, so that when she lies flat on her back the curvature is not at once perceived. There is also a slight tendency to talipes equinus, as shewn by a contraction of tendons in the feet. I have been unable to find any part of the body in which there is cutaneous anæsthesia : the neighbourhood of the joints are natural in their sensitiveness. She has no numbness or formication in ordinary posi-

tions, but when she sits up in bed, with the knees drawn up before her, and a book or any weight is placed upon her knees for any time, there is a feeling of numbness and deadened sensibility in the lower limbs. But there are no marked reflex actions, and no effect follows upon tickling or irritating the soles of the feet. She is also able to localise the sensations excited by such actions in a normal manner; though, if anything, the tactile sensibility of the lower extremities is somewhat lessened. Her appreciation of changes of temperature is correct. She feels cold much more than some persons, being rather shrivelled up by it, whilst she can bear heat with comfort. There is no depreciation of the faculty of distinguishing heat from cold; if anything sensitiveness is increased. In her whole condition I have never detected a single sign of an hysterical habit of body or mind, and all the family appear to be free from hysterical taint.

Her history is as follows. She was born in Camberwell, the second of eight children; her parents are living and healthy; they have not been subject to any nervous disorder, neither is there any strong hereditary tendency to be traced in going backwards. A brother of the father's died of general paralysis, and a cousin is peculiar, and inclined to become a kind of fasting girl—is grown up, but weighs only 5 stone. M. H. was nursed naturally; when between 2 and 3 years of age she was supposed to have some mesenteric disease, from which she recovered; and her general health continued good until 12 years of age. A slight unsteadiness of gait then began to be observed; it was considered that she had a spinal weakness, and tendency to curvature; her shoulder was said to have "grown out." She was taken by her parents to a physician celebrated for his treatment of spinal complaints, and placed under his care. She was ordered to keep a supine position on an inclined plane for two or three hours daily, and regular muscular exercise, whilst all mental education was completely interdicted. Some time afterwards iron supports were advised, and were continued in use for some years. The catamenia appeared at 14. She has always been regular, the monthly discharge making its appearance at the proper time, and in proper quantity, sometimes however being rather excessive, and lasting for 7 or 8 days. At 15 she had measles, but not severely, and recovered in the ordinary manner. At 18 the supports she had worn,

and the treatment she had been following, were discontinued. Her general health seemed pretty good, but the unsteadiness of gait continued. Her walking was clumsy, and there was no evident change for the better in her powers of progression, but she rather grew worse as she developed into a young woman. Six years ago she was placed under the care of a leading physician, and was also seen by a celebrated consulting surgeon. By these gentlemen she was advised to keep perfectly recumbent for a long period, and to persist with steel medicines. This plan was followed for fourteen months; at the end of that time she could not stand without assistance, and her unsteadiness of gait and want of power to associate her movements was not altered for the better. She gave up her plan of lying down, and took exercise out of doors daily. Moving into my neighbourhood, she came under my observation in December, 1868, and since that time has taken various medicines—Valerianate of Zinc, Phosphate of Ammonia, Hypophosphite of Soda, Nux Vomica, Cod Liver Oil, “et id genus omne,” without material alteration, there being a gradual, slow, but decided decrease of power. She has paid lengthened visits to the seaside, and has felt the better for the change, coming home stronger after each visit, but without any deviation in the irregularities of co-ordination of the muscles. During the time she has been under my care, there has not been the slightest evidence of hysteria in her state.

At the time when she last gave up the recumbent treatment, her weight was

		st.	lb.	oz.
Dec., 1868,	- -	8	6	9;
she weighed in June, 1869,	- -	8	11	11;
Oct., „	- -	8	8	14;
„ 1870,	- -	8	7	5;
„ 1871,	- -	8	0	0;

so that at first she gained flesh, but during the past year she has lost 7 lbs. in weight.

The condition of the younger sister, E. H., now aged 27, is very similar, though at this time she is not so helpless or with such manifest symptoms as her elder sister had three years ago. She was born and brought up in Camberwell, nursed naturally,

was quite healthy as a child, and never had any serious illness. When she attained the age of 12 she was supposed to have a twist in the back, and was also under the care of a physician noted for his treatment of spinal disease for 5 years, and during that time wore supports of various kinds. She discontinued them for 5 years, and then resumed them for $1\frac{1}{2}$ years. The irregular gait was first observed when she was about 14, and was made manifest, and brought significantly before her, one day when she attempted with other children to walk on some planks. The irregularity and uncertainty continued to increase; at 20 she was much the same as her sister at the same age; she could not get up and down steps without assistance. As a child she was plump and well nourished. The catamenia appeared at 13, sometimes coming on a few days later (instead of earlier, as was the case with her sister); she sometimes had faint feelings which were temporary, occurring contemporaneously with the catamenia. She is now fairly developed, and has a rosy, healthy looking face. When she speaks, it is with hesitation, and as if she had something in her mouth beneath the tongue. She is able to thread a needle, but is not expert at working, though she can do it if she keeps her eyes steadily on her work. Her eyes are brighter than her sister's, but not so prominent. The pupils act fairly and equally, are quite obedient to light, and there is no injection of conjunctiva or unequal action of optic muscles, no amblyopia. She can rise from her chair with the eyes closed, but on resuming her seat it is with a sudden flounce. She walks more nervously than her sister, the progression is more sudden, amounting almost to a half run. The head and shoulders are more shaky; they move somewhat differently to what is observed in chorea, as if the cervical muscles were unable to act equally together at the same moment of time. This movement is not constant—on some occasions it is scarcely seen at all. Her muscular power is considerable; it is greater than her sister's; one cannot easily bend her elbow joint against her will. Her power is sometimes lost, as when her attention is directed elsewhere, but sight is not so necessary to her as to her sister. There is no impairment of muscular nutrition, and no impairment of the sensibility of the muscles, so far as is evidenced by the rough processes to which I have submitted them. The skin has its sensibility intact both to heat and cold, as well as to touch and electrical

action; her appreciation of temperature being as perfect as her sister's. She has never had any pain or numbness of any kind, and no tremulous states have at any time been felt, or can be induced by the electric battery. I cannot find any part of the skin showing evidence of anæsthesia. She is able when standing to separate the legs one from the other better than her sister. She is able also to hold a hollow paper ball in her hand, and change it from one to the other with her eyes shut without crushing it, though she cannot exactly touch the point of the nose without mistake, the eyes being closed. There is no affection of the bladder; the urinary secretion is healthy and undisturbed.

	st.	lb.	oz.
Her net weight in Dec., 1868, was	-	-	7 12 2;
June, 1869,	-	-	7 7 14;
Sep., „	-	-	7 9 14;
Nov., 1870,	-	-	7 10 6;
Oct., 1871,	-	-	7 12 4.

It is thus seen that she has not much varied in weight during the last three years. She has taken the same remedies, and followed the same course of treatment as her sister.

She also has a spinal curvature, but the principal deviation is to the right side; there is a considerable prominence of the ribs beneath the right shoulder, whilst the compensating curve is lower down. I understand that the curvatures have not varied in intensity since they became young women.

I have but few remarks to make upon the Cases I have brought to your notice, not being competent to do more than allude to the intricate points which may fairly call for the consideration of the Fellows of the Society. They may be divided into four heads:

- (1) The First Cause for the developement of the disease.
- (2) The Nature of it; with which is connected
- (3) Its Pathology, and
- (4) Its proper Treatment.

The first point, viz. the Cause, must I think be looked for in some deficiency of power, arising out of defective growth and nutrition of the body. There is a slight association only in connection with family history; but the fact that two sisters

are all but alike in their disease, which has commenced at the same age in each, and passed through the same phases through a long series of years, points to something as being due to stock. It is quite certain that its causation cannot be due to those libidinous excesses to which locomotor ataxy is often imputed, for the symptoms had a commencement before the menstrual function shewed itself. I think defective nutrition must be the prime cause, and that the curvature was coincident in point of time with the second cause.

The Nature of the disease is embraced in this second point. If the translator of Trousseau's Clinical Medicine is right in stating that "the pathognomonic symptom of progressive locomotor ataxy is the peculiar deficiency in the power of co-ordinating voluntary movements," then these Cases appear to be specimens of that disease. But the absence of all pain, of all ocular disturbance, and all interference with urinary functions, appear to separate them from ordinary cases of locomotor ataxy. That disease is also said to be more general in males than females, and is unusual in early life. The only class of cases that I can associate them with, are the so-called cases of Muscular Anæsthesia; though I am not able to say that the sensibility of the muscles themselves is so impaired as to be easily manifest; the want of co-ordination being the most prominent symptom. At the same time it is quite probable, that the signs indicative of a fully developed case of locomotor ataxy, may not be long wanting, but may appear as the patients grow older.

The conditions which give rise to muscular anæsthesia are not so well known, and the opportunities of making out its pathology are less frequent than has been the case with locomotor ataxy, and it may be that the latter disease has two origins, a centric and an excentric. As far as the cases before us are concerned, I think the mischief must be limited to the cord, and that anything like cerebral or rather cerebellar complication, need not be entertained. The undisturbed intellectual power, the absence of objective symptoms of brain disturbance, and the perfect state of the optic organs, forbid the idea. Where then is the disease? The experiments of Longet and Bernard have shown that if the posterior roots of the spinal nerves are divided, there is loss of co-ordinating power, and the harmony of movement is lost; and J. Lockhart Clark has distinctly made out in many

cases of locomotor ataxy, that the posterior columns of the spinal cord and the posterior roots of the spinal nerves were diseased. The morbid appearances being degeneration of grey matter, diminution of consistency or induration. But in those cases in which disease of posterior columns have been found, it has also been observed that the irritability of the muscles has been greatly depressed, whilst their sensitiveness to pain has been greatly increased, and electric currents have excited violent pains. This has not been the case here. There is an entire absence of every kind of pain; moderate galvanic currents are not distressing. There is no cutaneous anæsthesia whatever, and the excito motory functions of the spinal cord are perfectly natural.

It is supposed by Trousseau, that the dilatation of pupil which takes place during an attack of pain in locomotor ataxy, is brought about by an action conveyed from the cervical portion of the sympathetic system of nerves, through the anterior roots of the two upper dorsal nerves; but that when pain is absent, there is injection of conjunctiva and firm contraction of pupil; and that the absence of the dilatation of pupil, when a painful impression is made upon lower extremities, shows disease of the sympathetic, and a non-propagation of effect. If this is so, would it not indicate that impressions are conveyed to the cord in its whole length by the sympathetic ganglions, and that if the channels of communication are destroyed, then there will be an interference with some faculty which may be the co-ordinating power in muscles. That in these cases this channel has been broken between some of the dorsal ganglia and the cord; and that the difference between muscular anæsthesia and locomotor ataxy is, that in the former case the mischief commences in the ganglion and extends to the columns of the cord through the communication between the ganglion and the posterior roots of the spinal nerves, in which case the loss of co-ordinating power is the first symptom; but that in the case of locomotor ataxy, there is degeneration of grey matter in the posterior columns of the cord from the commencement, and, in such cases, the flying pains, so often considered rheumatic, are the first signs of the disease.

The explanation of these Cases may be assisted by considering the results which sometimes follow the effect of

stimulants, the symptoms which result from the exhibition of conium in poisonous doses, and the states which arise in the course of an attack of chorea. Some men show temporary symptoms of the disease when intoxicated, their muscular power and mental condition not being affected, but co-ordination of muscle is lost. Again, the parts affected in these girls, are those which are most paralyzed by the action of conium, and are apparently the seats of disease in cases of the kind before us. It appears to me that an industrious and persevering examination in directions I have indicated, together with the light thrown upon them by the pathological states proper to chorea, in which co-ordination has a greatly disturbed state from a cause which is probably altogether different, would lead to a satisfactory solution of their true pathology.

As regards the fourth point which is suggested for our consideration, I have but little to say. I have sketched out the course taken in these cases, viz., first—support within and without, with mental rest; then rest both mental and bodily; now nourishment and everything that will assist in promoting nerve nutrition. Those points have appeared to me the indications to be followed. The result has not been satisfactory. Can the Fellows suggest a better course? I should mention that the action of an intermittent galvanic current was continued for several months, without any benefit being perceptible to the patients or myself.

I have to thank my partner, Dr. Lanchester, for another Case which is here this evening for the inspection of the Fellows, viz.—a typical case of Locomotor Ataxy; and who, a few weeks ago, could only walk by the aid of crutches, but now is very much better. I saw the case for the first time this morning; I can only state therefore that the man, George Tinders, is æt. 49, a bricklayer by trade; five or six years ago he became subject to the usual flying pains in his legs, which were called rheumatic; four years since he lost his power of co-ordination in the muscles of his lower limbs; and three years ago he lost his sexual power; and then appeared a feeling as if he had light bands around his loins and in the hypogastric region. He has been under my friend's care as a patient in the Croydon General Hospital, and is a typical case of Locomotor Ataxy. He cannot walk in the dark; a little excess of stimulant takes

away his power of progression entirely; he has some inconvenience of urine, and flying pains; but the power of individual muscles is still great. He thinks himself well, except for his want of control over the muscles of his lower limbs.

After the paper was read, the young ladies were introduced and examined by the Fellows, and also the typical case of locomotor ataxy, and their symptoms compared.

A discussion then took place, in which Dr. Lockhart Clarke and Dr. W. B. Richardson joined; at the conclusion of which the President (Dr. Andrew Clark) proposed that a Committee be formed, to examine the Cases and report upon them at the next meeting of the Society. He named Drs. Richardson, Hughlings Jackson, and Carpenter, and requested the assistance of Dr. Lockhart Clarke. The discussion was then adjourned, the President thanking Dr. Carpenter for his paper, and also the ladies for the opportunity they had afforded the Society of seeing them.

At the next meeting, (Nov. 24, 1871,) Dr. Thorowgood read the report of the Committee:—Present, Drs. W. B. Richardson, Hughlings-Jackson, and Carpenter, members; Dr. Lockhart Clarke, Dr. Broadbent, and Mr. Brudenell Carter, visitors.—The following points were fixed upon as the subjects of the report to be made: (1) Facts ascertained by inspection; (2) the state of the cutaneous sensibility as shown by points at graduated distances; (3) as shown by electricity with carbon point; (4) the state of muscular contractility and sensibility to induced (faradaic) and continued (galvanic) currents; (5) the degree of vascular resistance to freezing by ether spray.

In the case of the elder sister, aged 28, there was found (1) on inspection, a very marked lateral curvature of the lower dorsal spine to the hip, as described by Dr. Carpenter. In walking the toes were turned in, and the feet were thrown forward with a slight jerk, and brought suddenly and heavily to the ground. She walked worse with the eyes shut. Says that when her eyes are shut, she does not know whether she is in the upright position or not; but when her eyes are opened she could advance, and draw back either foot, and know exactly where the feet were. Although she never walked without

assistance under ordinary circumstances, she walked a short distance alone, and made one or two steps with the eyes closed. She stood for some time, the eyes being shut, without falling. In these experiments she was assured by the observers that she would not be allowed to fall. [It was evident that the exertion could not be long maintained.] (2) Cutaneous sensibility, as tested by points, Dr. Lockhart Clarke found to be about normal over back and at various points on leg. It was observed during the investigation that red spots quickly appeared when the points had been applied; and the mother stated that bites or stings of insects produced great irritation, which lasted many days. (3) Cutaneous sensibility, as tested by the induced and continued current, with carbon points (Dr. Richardson's). Interrupted current, at eight points, caused gentle sensation at outer side of thigh; lost at six powers; on inner side, seven powers felt, lost at five. Continuous current of thirty powers not felt on outer part of thigh; caused burning sensation at inner aspect. Similar results from comparative experiments on Dr. Carpenter; muscular contractility and sensibility tested by faradaic and galvanic electricity with moist sponges. Induced current of full power caused no contraction, and little sensation in muscles of calf or anterior aspect of leg, powerful contractions in muscles of thigh; with some pain, but much less than in comparative experiments on observers, and on muscles of arm of patients. Continuous current (fifteen cells): no effect on muscles of calf or front of leg, either in making or breaking contact; burning pain when contact made. Conclusions made by Drs. Richardson and Clarke: Great impairment of muscular contractility; no loss of muscular sensibility. This patient resisted powerfully flexion or extension of the knee-joint.

CASE 2. (1) Inspection: Curvature of spine slighter and lower down. Stronger than her sister. Requires guidance, but not much support in walking. Gait unsteady and feeble; no jerking of limbs. Says that when eyes shut, she does not know whether she is in the perpendicular position or not, and would not know whether she were leaning on one side. She walked the length of the room alone, and for about six steps with the eyes closed. Stood for some time with the eyes shut, the body swaying slightly to and fro. Can move legs into any

position when eyes shut, and knows exactly where they are. (2, 3) Cutaneous sensibility normal. (4) Muscular contractility much below normal standard; but strong induced currents caused decided contractions in the muscles of the calf and front of the leg. Experiments with ether spray :—CASE 1 : Freezing took place on outer side of leg with three strokes, $2\frac{1}{2}$ " ; in Dr. Carpenter, six strokes in $9\frac{1}{2}$ " ; patient's forearms, eight strokes, 8" ; outer side of thigh, eleven strokes in 15". CASE 2 : Outer side of leg freezing by three strokes, 2.75" (repeated several times with similar results) ; lower down, above outer malleolus, six strokes in 10".

The discussion which ensued has not been reported at length ; it was joined in by all the members of committee, and Dr. Richardson expressed an opinion that Dr. Carpenter's ideas of the pathological changes were probably right. No further suggestions were made as to treatment, except an approval of the principle which had been followed.

The Cases have been under frequent observation since they were produced at the Society's rooms. There is no decided change in their condition—certainly not for the worse—but a younger brother, who has distinguished himself at one of the public schools, and has carried off high honours at one of the universities, had signs of incoordinated movements of the lower extremities, which continued for a short time and disappeared under a tonic treatment. The general health of the girls has been improved by the course of treatment they have undergone, and they have passed through the winter without any further loss of power. The peculiar action of ether spray in producing a freezing state much more rapidly than in healthy persons still continues, and the muscular contractility is much below the normal standard.

I republish the Cases hoping to draw more attention to the peculiar states which have arisen in them, and which appear to be arrested by the treatment pursued.

CROYDON ;

May 28, 1874.

