

extensor following infantile paralysis;<sup>3</sup> some mechanical cause acting during intra-uterine life; some congenital weakness of the part.<sup>4</sup> Previous relaxation of the ligaments of the joint is considered necessary by Professor Steubel.<sup>5</sup> Hamilton<sup>6</sup> says: "In some persons there appears to exist a preternatural laxity of the ligamentum patellæ or of the quadriceps extensor, which exposes the subject to this accident from a very slight cause. The operation performed by Mr. Pollard is, we believe, the first of the kind that has been done. The operations suggested or others performed for the remedying of the condition on failure of apparatus to correct the ill effects of the dislocation have been: 1. A lateral incision and the suturing of the inner edge of the bone to the tissues on the inner side of the joint, the patella having been pushed well inwards (Wright). 2. Removal of the patella (Fowler). 3. Osteotomy of the femur and the production of a condition of bow-leg (Davies-Colley). The operation, a severe one, has been most successful. The following description is from notes by Mr. Raymond Johnson, late surgical registrar.

The patient was a young woman aged twenty-one years, who had followed the occupation of a domestic servant. She could not fix the period at which her patella became displaced. The affected limb had been weak from childhood, but neither the patient nor her sister had noticed anything wrong with the knee. In December, 1885, she slipped and fell, but did not notice that anything had happened to her knee, and she was able to walk a distance of a quarter of a mile to her home. Since the accident she had walked lame. A few weeks later she was admitted to University College Hospital, under the care of Mr. Marcus Beck. She had well marked genu valgum on the left side, and when she attempted to bend her knee the patella slipped down on the outer side of the external condyle of the femur.

On Jan. 28th, 1886, Mr. Beck performed Macewen's operation for genu valgum, which was completely and permanently corrected thereby, but the readiness with which the patella became displaced during flexion of the knee was in no way altered. The dislocation of the patella was the source of much pain, and the patient said that it incapacitated her from following her occupation. She was readmitted to the hospital in December, 1890, and during the Christmas vacation, owing to Mr. Beck's absence, she came under the care of Mr. Pollard. The left knee was smaller than the right one. When the limb was extended, the inner edge of the left patella projected more forwards than natural, and lay in about the mid-line of the limb. At a little distance internal to the inner border of the patella a ridge could be felt, which appeared to be the inner border of the trochlear surface of the femur. Between this ridge and the patella there was a slight groove. When the patient bent her knee the patella slipped down on the outer side of the external condyle of the femur, and no force could prevent the displacement as soon as a few degrees of flexion had been made. Flexion was painful, but was possible to a few degrees beyond a right angle. The width of the right patella was an inch and a half, and that of the left was three-eighths of an inch less.

On Dec. 30th Mr. Pollard operated as follows: The limb being rendered bloodless by means of Esmarch's bandage and tourniquet, and the skin being most carefully cleaned, an incision about two inches in length was made outside and above the patella, and the insertion of the vastus externus and the outer part of the capsule of the joint were freely divided, but it was still impossible to replace the patella or to prevent its slipping on the outer side of the condyle when the knee was bent. An incision about 3 in. long was now made a little internal to the inner border of the patella, and the joint was freely opened at this spot. The trochlear surface of the femur was found to be exceedingly small in all its dimensions. The groove was only broad enough to take the little finger, and the outer border of the groove prevented the replacement of the patella, which, even in the extended position of the limb, was found to rest on the external condyle, outside the trochlear surface. The cartilage and some of the bones were chiselled away until a sufficiently broad and deep trochlear surface was made. The patella could then be placed on the new articular surface, and during flexion and extension it slid

downwards and upwards in a perfectly normal manner, the old tendency to external dislocation having quite disappeared. In order to secure the patella more safely in its new position, a strip of capsule about 1½ in. long and ¾ in. wide in the middle was excised and the borders of the wound were sutured with silk. In this way the inner side of the capsule was braced up. During the operation the wound was constantly irrigated with a 1 in 4000 solution of perchloride of mercury. The inner skin wound was completely closed, but the outer, which was made to penetrate the joint at the lower part, was left open at this spot, in order to give vent to any effusion which might take place within the joint. No tube was employed. The knee was dressed with cyanide of mercury gauze and sal alembroth wool. The limb was fixed in a trough of Gooch's splint. The temperature reached 99·8° in the evening of the first day after the operation; it then gradually fell, and reached the normal on the fourth day. The patient had a good deal of pain in her knee on the day after the operation, but after the second day she was free from spontaneous pain. The dressing was changed on the eighth day after the operation. The discharge was dry. The knee was alternately passively flexed and extended. The movements caused much pain, and the patella was felt to grate against the bony surface of the new trochlear articular surface, but the patient was able to flex and extend her knee voluntarily. The patella showed no tendency to slip from its position. Passive movement was repeated on the thirteenth, fifteenth, and nineteenth days. The stitches were removed on the fifteenth day after the operation. On the twenty-first day the patient was allowed to get up, and on the twenty-eighth day she was able to walk down the ward. She went home on the thirty-second day after the operation. The patient was shown at the Clinical Society on April 24th. It was then four months after the operation. The movements at the knee-joint were free and painless; there was a little grating as the patella slid over the new trochlear surface. The patient said that her leg was stronger and more serviceable than before the operation. She had resumed her occupation as a domestic servant, and was able to scrub out four bedrooms and walk four miles in one day without any inconvenience to her knee.

#### JOHANNITER HOSPITAL, BEIRUT, SYRIA.

A RECORD OF SOME CASES INJECTED WITH TUBERCULINUM KOCHII.

(Under the care of Dr. H. GRAHAM.)

THE line of treatment followed has been that described by Professor Libbertz, the commencing injection in all cases of phthisis being 0·001 grm. The fluid was diluted with distilled and sterilised water, and the dilution raised to the boiling point each time after the patients had been injected before again closing the tube with cotton. The sputa were in every case examined before the patient was put under treatment, and the tubercle bacillus was found. The day after each injection the sputa were again examined in each case to see if any change had taken place. Each patient was carefully weighed once a week, and the weight recorded to determine whether there was gain or loss.

CASE 1.—E—, a carpenter aged twenty-two. His family history is good, and he himself is well built, but nervous-looking, with clear white skin, and hectic spots on his cheeks. He entered the hospital on Feb. 5th, complaining of cough, feverishness, and some emaciation, from which he had been suffering about two months, but up to that time had been in excellent health. He complained of weakness and loss of appetite, but had no night sweats. On the right apex there was dulness, increased vocal resonance, prolonged and roughened expiratory sound, and a few subcrepitant râles. A few bacilli were found in about half the cover glasses examined. The first injection was followed by a marked reaction, but in no case did his temperature rise higher than 39° C., so that the dose was rapidly raised, and on March 8th he was given 0·150 grm. without any reaction. The physical signs had cleared up and his cough with expectoration had ceased. He was discharged on March 9th, and since that time has been constantly under observation, and there have been no signs whatever of a return of his disease.

<sup>3</sup> Maligne; also Pitts, Med. Soc. Trans., vol. xii.

<sup>4</sup> Wright and Ashby, Diseases of Children, p. 648, and others.

<sup>5</sup> Holmes' Surgery, p. 464.

<sup>6</sup> Fractures and Dislocations, p. 893.

CASE 2—M. S.—was admitted on Feb. 4th. She is twenty-two years of age, married, and has two children. Her father died of phthisis after four months' illness, and one sister died at the age of twenty-two from the same disease after three months' illness. The patient had been ailing for some two months before admission, suffering from cough and emaciation for one month. Her condition on admission to hospital was not good, as she was already much emaciated and suffered greatly from a high temperature, which was constantly between  $38.5^{\circ}\text{C}$ . and  $39.5^{\circ}\text{C}$ ., and from night sweats. The physical signs, however, did not indicate more than an extensive consolidation of the left apex, and but few bacilli were found in her sputa. After the first injection the temperature rose to  $40.1^{\circ}\text{C}$ ., but fell the next morning to  $37.7^{\circ}\text{C}$ ., but soon rose again to  $38.5^{\circ}\text{C}$ . She was injected twice a week for one month, the bacilli constantly increasing in number, and her temperature always remaining very high. She lost weight rapidly, and was troubled much with a severe dry hacking cough, which could not be relieved. The physical signs during this month seemed to indicate no progress. The injections were discontinued when they had reached a dose of 0.018 grm. After the injections had been discontinued for about a week she seemed to grow worse even more rapidly than before, the physical signs indicating rapid destruction of the lungs. She was discharged on March 18th, and has since not been heard of.

CASE 3—N. J.—, aged eight, entered the hospital on Feb. 3rd. His father died of phthisis. A year ago Dr. Post had resected his elbow-joint for caries, but after some six months the disease had returned, and upon admission the elbow was much swollen and discharging from three sinuses. The wrist was also swollen and discharging. The apex of his right lung was consolidated to a considerable extent. He was weak and emaciated. After the first injection of 0.001 grm. his temperature rose to  $40.7^{\circ}\text{C}$ ., but fell again the following day to normal. The injections were gradually increased until the beginning of April, when the dose of 0.05 grm. was given. The injections have always been accompanied by a very marked general reaction, and by but little local reaction. The swelling has gone almost completely from the elbow, and the discharge is very slight. Very few signs of consolidation of the right apex remain. He has increased in weight, and his general condition has improved very much. He has had no other treatment either medical or surgical. For the past week the improvement has not been marked, if there has been any, and his temperature, which always returned to the normal the day after the injection, now remains somewhat up for the second and even the third day.

CASE 4—E. S.—, aged eighteen, was admitted to the hospital on Feb. 8th. Her family history is good. She had been treated for phthisis at the Polyclinic for about a year. On admission she was suffering much from fever and night sweats. She had no appetite, was emaciated, and her feet were oedematous. Her voice was very husky, so that she could not make herself heard at any distance, and she had suffered from diarrhoea. By physical examination there were depression and limited motion of the upper part of the right chest, dulness on percussion, extending nearly to the base, increased vocal resonance, cavernous respiration just under the clavicle, and subcrepitant râles as low as the fourth rib in front. No signs were found on auscultation to account for the dulness reaching almost to the base. The left lung did not seem to be implicated. The expectorated matter was large in amount, and contained very many bacilli. The first injection was given on Feb. 9th, and was followed by a marked general and local reaction, as were all the succeeding ones. This patient constantly affirmed that when the injection was given on the diseased side the reaction was much greater than when the injection was made on the other. Within two weeks her night sweats had almost ceased, and her temperature between the injections was almost normal, but her throat was very much swollen, and she could only speak in a whisper. At the end of a month her voice was as good as ever, and the pain and swelling were completely gone. She increased in weight gradually for the first six weeks, her appetite and strength returning to a very marked degree. Her sputa were much less and contained very few bacilli, at times eight or ten cover glasses being examined without finding any. After eight weeks' treatment she seemed to remain at about a standstill, and was sent home. Since then she has been under observation, and has grown no worse. Her

condition, as shown by general symptoms and local signs, is, beyond a doubt, very much improved, and as she has not ceased to react improvement may still be expected. The physical signs in this case have been very much changed, there being now no cavernous respiration, and but few subcrepitant râles. The dulness on percussion has been unaffected.

CASE 5.—W. A.—, aged twenty-two, was admitted to the hospital on Feb. 20th, 1891. One brother died of phthisis. On admission he had been ailing for a year and had had a cough, which increased very much when winter came on. One month previously he was attacked with severe vomiting and nausea, so that he was unable to take any solid food whatever for a week. He was much emaciated and his temperature was  $39^{\circ}\text{C}$ .; a rise in temperature which was followed by an exhaustive colliquative sweat. On physical examination the following were found: Flattening and sinking of the right apex, subcrepitant râles as low as the third rib in front, tubular respiration just below the clavicle, and dulness on percussion. The first injection was followed by a moderate reaction, and he was given the lymph twice a week in gradually increasing doses. There has been a gradual improvement in his general condition, with an increase in weight. He has, however, been kept back by a very severe dry cough, which has not been relieved by treatment. It is always worse for a day or two after an injection. The bacilli have never been abundant, and lately have not been found. The physical signs of disease have largely disappeared.

CASE 6—N. S.—, aged twenty-two, entered the hospital on Feb. 20th. His mother died of phthisis, and he has a sister who is now suffering from the disease, which in his case has been of fully a year and a half's standing. He suffered from night sweats and diarrhoea, but at the time of entrance his temperature was about normal, and he was in a fairly comfortable condition as far as symptoms were concerned. There were signs of a cavity at the upper and back part of the right lung and consolidation of the upper part of the left. He expectorated a great deal of purulent mucus, full of bacilli. His first injection was given on Feb. 21st, and the last one up to date was 0.08 grm. He has made constant improvement, gaining in appetite, strength, and weight. His night sweats have ceased, and he has not at any time had a return of his diarrhoea. At the present time he spits very little purulent matter, but a great deal of frothy mucus. He gradually increased in weight up to the fifth week, then lost somewhat, and has remained stationary as regards weight for the past week (April 8th). The physical signs, however, have shown a better condition of the lungs, with a diminution in the size of the cavity and a disappearance of late of the subcrepitant râles during the intervals between reactions. He has had cod-liver oil and tonic treatment in addition.

*Remarks by Dr. GRAHAM.*—The treatment was begun early in Case 1, and as nearly as I can tell the patient has been completely cured. In addition to the injections, he had quinine, iron, and arsenic, with a sedative expectorant mixture. Among the cases of phthisis which have been reported, and others under treatment for a shorter length of time, in almost all the treatment has at first been followed by a very marked improvement in the local symptoms and general condition. After the patient has undergone treatment for from six weeks to two months the remedy does not produce so prompt a reaction, and the patient seems to remain at a standstill. He has undoubtedly been improved, but not completely cured, and it seems as though he would easily go back to his old condition. The injections were in no case accompanied by any untoward symptoms, nor has an abscess in any case followed. It was noticed that usually after the patient had undergone treatment for a week or two the number of bacilli was increased, and at the end of a month they were reduced in number very markedly. It has been noticed also that the sputa after a month's treatment were apt to become very thick, streaked with or tinged by blood, and to contain much fibrinous material, which coagulated on the cover glasses in the form of an exceedingly fine dense network. These dense sputa were accompanied by a large amount of light frothy mucus. The following two cases of lupus are the only completed ones. Both were bad cases to treat, as they had lasted a long time, and were of a very severe type. It would be unfair to draw conclusions against the lymph from such unfavourable cases.

CASE 1.—The patient was sixty-five years of age, and the

ulcer was of about three years' standing. He had been admitted to the hospital on July 10th, 1890, and during his long stay had had the ulcer cauterised weekly with caustic potash. His left eye was completely gone, the ulcer encroaching on the eyebrow at one margin, and on his mouth at the other. There was a hole through into the posterior nares large enough to allow of the passage of the index finger. He was pale, weak, and anæmic, and had suffered much from the pain. He was given the first injection of 0·010 grm. on Feb. 6th. This produced some reaction, local and general, his temperature rising to 38·4° C. The dose was gradually increased, and on March 3rd he was given 0·3 grm. For the first two weeks the ulcer appeared to be cicatrising, but then it seemed no better for a week, and when the injections were withheld it went gradually back to its old condition. To ascertain whether the ulcer might be an epitheliomatous one, a portion was removed from the margin of the growth, fine sections were cut from it with a Schause microtome, and, having been stained according to Gram's method, in several of them a few tubercle bacilli were found. The patient was again injected after this with 0·4 grm.; but no reaction having followed, he was discharged in even a worse condition than he was before the treatment was begun. Twice after large injections this patient was unable to get out of bed except with great difficulty, complaining of stiffness all through his body.

CASE 2.—A woman, thirty-five years of age, from the desert, with lupus exedens of four years' standing. The eye was gone and a portion of the nose, and the ulcer, which was about four inches in diameter, extended deeply into the orbit. She had been under treatment in the hospital for eight months, and had improved somewhat. The first injection of 0·01 grm. was given on Feb. 6th, and in all she received twenty-two, the maximum being 0·3 grm. The ulcer began to cicatrise after the first injection, there being marked local reaction, although almost no general, and continued for about six weeks to skin over, until fully three-fourths of the ulcer was covered. Then the reaction ceased to follow the injection, and no more improvement took place. In fact, the ulcer seemed to be enlarging again. The woman refused to stay in the hospital any longer, and has not been seen since.

The following cases were injected without producing any reaction: (1) A young man suffering from mitral regurgitation, with signs of brown induration, dose 0·01 grm.; (2) a case of chronic pneumonia following measles, dose 0·01 grm.; (3) a little girl with swollen glands of the neck and axilla, dose 0·007 grm.; (4) three cases of disease of joints, evidently non-tuberculous, dose in each case 0·008 grm.

## Medical Societies.

### ROYAL MEDICAL & CHIRURGICAL SOCIETY.

#### *The Changes in Healthy Arteries and in Tendon Ligatures during the first four weeks after Ligation.*

AN ordinary meeting of this Society was held on May 26th, the President, Mr. TIMOTHY HOLMES, being in the chair.

Dr. SHERIDAN DELÉPINE and Mr. C. T. DENT read a paper on the Changes observed in Healthy Arteries and in Tendon Ligatures during the first four weeks after ligation. The authors first explained the origin of the paper. They gave a detailed account of the state of healthy arteries five, nine, thirteen, seventeen, twenty, and twenty-three days after ligation in their continuity. They summed up these results as follows:—1. (a) When a healthy artery was tightly tied in its continuity and the ligature was sufficiently applied, a permanent obstruction was invariably obtained, whether a clot formed or not, and whether the point of ligation was near a collateral branch or not. (b) Up to the fifth day the proximal end of the occluded artery was gradually filled up with coagulated blood, which by the fifth day formed a plug composed of clots of various ages. Through the unequal shrinking of the various clots channels were produced, chiefly at the periphery of the thrombus, and into the crevices thus formed fresh blood penetrated. Thus a "spurious circulation" was established. (c) From the fifth to the thirteenth day the proliferating elements of the intima penetrated into the sides of the clot and bridged

over its surface. By the thirteenth day tracts of young fibrous tissue extended all through the clot, and a thick layer of flattened cells, continuous with the intima, covered the proximal surface of the clot. (d) The remains of the clot were gradually absorbed, and by the thirteenth day only a few scattered masses of pigment indicated the previous existence of the thrombus. As the absorption went on the plug shrank, and ultimately its surface became concave. (e) While these changes were going on within the vessel, similar processes occurred in the exudation surrounding the ligature outside the artery. Embryonic vessels formed in this region as well as in the artery. At first these embryonic vessels were simply solid columns or tracts of spindle cells, and were therefore only "potential vessels." (f) By the twenty-third day both the extra-arterial and intra-arterial new vessels began to extend through the degenerated muscularis close to the seat of the ligature. Inosculation of the new vessels took place, followed by canalisation, and thus true circulation was able to take place through the new set of true vessels. (g) The ligature during the whole of this time underwent slow absorption, and was gradually replaced by young connective tissue. 2. From these results the following inferences were drawn: (a) That tight ligation of healthy arteries resulted in sound and permanent obstruction within two weeks; (b) that tight ligation with flat tendon ligature did not injure the fibrous coat of the artery, even though it were applied with sufficient force to cause complete rupture of both internal coats; (c) that the obstruction of the vessel by young fibrous tissue, replacing the clot, was complete long before the flat tendon ligature showed any sign of being absorbed or of giving way. 3. (a) The use of tendon was advocated, because this material was very uniform in structure and because the shape presented certain advantages; (b) tight ligation was advisable, because it gave results which were constant, and which were speedily and with certainty obtained. 4. The use of the loose ligature was deprecated, and in criticising that method allusion was chiefly made to Messrs. Ballance and Edmunds's paper, on account of its being one of the most recent and important contributions to the subject. Loose ligation should be avoided because (a) the method did not give constant results; (b) it did not give the same results as tight ligation within the same time; (c) it did not offer any advantages whatever as regards the operative procedure, and, if anything, was more troublesome to carry out than the recognised method. 5. In conclusion, the authors discussed the question briefly from the clinical point of view, and stated their conviction that the results of their investigation were supported by practical experience. They considered that tight ligation was the method least likely to lead to injurious consequences to the ligatured vessel, and most likely to bring about the effects which it was commonly desired to obtain by the operation.

The PRESIDENT said that he had devoted a good deal of thought to this subject, at which he had also worked practically, though not by modern microscopical methods. He had come to the conclusion that it was safer and easier for the surgeon, as well as more prudent for the patient, to have the vessel tied with such an amount of force as to divide its inner coat. This incurred no extra danger, and one was sure of producing a permanent obliteration of the lumen of the vessel. In the history of many of the cases of arterial ligature which had done badly the cause was found to be due to a too early establishment of free circulation through the weakened vessel; the danger was a practical one, and was greater than the theoretical benefit from the avoidance of rupture of the internal coat. John Hunter, when he first tied an artery in St. George's Hospital nearly 130 years ago, used three or four flat tapes in order to obliterate the vessel without division, and some surgeons at the present day were inclined to imitate this loose ligature. He thought that at the present time a sufficient amount of practical evidence had been collected to say that those surgeons who had used the tight ligatures had not been less successful than those who had employed the occlusion method.

Mr. MACNAMARA agreed that the tight ligature gave the greatest chance of recovery to the patient. He had ligatured the common carotid, the external iliac, and the common femoral recently with a good result. He used silk ligatures which had been previously boiled in carbolic acid. The tissues around the artery were disturbed as little as possible in the application of the ligature; no blood-clot was left in the wound, deep sutures as well as superficial