when working for his Miranda. For my own part, "the mistress which I serve quickens what's dead, and makes my labours pleasures."

We who make up the Medical Society are members of an essentially active profession, and while we remain in our prime let us do our best here actively. For age, like infancy, is mostly passive, or, as Edgar reminds us in *King Lear*:

Men must endure
Their going hence, even as their coming hither;
RIPENESS is all.

NOTES AND REFERENCES.

¹ *Diary of the Rev. John Ward, A.M., Vicar of Stratford-on-Avon*, extending from 1648 to 1679. The Society's Library possesses a copy of the same, printed and published by Colbourn of Great Marlborough Street in 1839 (long out of print). Mr. Sidney Lee's valuable work, just published, throws much light on Shakespeare's later associations with Stratford. ² "Ce qu'il y a de fâcheux auprès des grands, c'est que, quand ils viennent à être malades, ils veulent absolument que leurs médecins les guérissent," *Le Malade Imaginaire*, Act ii, Scene 6. ³ BRITISH MEDICAL JOURNAL, vol. ii, 1883, p. 1103. Arthur Creswell Rich, M.B. Lond., died in May, 1888, and an obituary notice will be found in the JOURNAL, vol. i, 1888, p. 1091. I do not know what has become of the copy of Riverius's book which contains this remarkable epigram. I suspect that Dr. Rich modified the spelling, which (except "voyce" for "voice") seems too modern for 1653. Dr. Rich was for several years special Liverpool correspondent to the JOURNAL. ⁴ Boccaccio, *Decameron*, giorn. iii, Nov. 9, Martinelli's edition, 1762. ⁵ Boccaccio, *loc. cit.* Dr. Bucknill, in *The Medical Knowledge of Shakespeare*, quotes the passage, which shows that the Italian author spoke of a thoracic fistula. Dr. Moyes (*Medicine and Kindred Arts in the Plays of Shakespeare*) traces Shakespeare's version to an intermediate tale by Painter, where it is distinctly stated that "the French king had a swelling on his breast, which by reason of ill-cure was grown to be a fistula." I have added above Boccaccio's specification that the receipt was a powder of certain herbs. From what I can make out, the King was probably the Dauphin Charles, who was a youth of 16 in 1353 when the *Decameron* was published. When a child he had a long illness and an abscess discharged under his arm. I find that his chronicler, Christine de Pisan, states that Charles remained sickly and subject to feverish attacks all his life. All sorts of nostrums were tried, it appears. In 1380, when he was Charles V of France, the fistula ceased to discharge and he died within a fortnight. Boccaccio may refer to an earlier case, but there was probably much talk when he wrote the story about the Dauphin's illness, so that he chose thoracic fistula as the particular disease which Helena managed to cure. ⁶ BRITISH MEDICAL JOURNAL, March 11th, 1899, p. 583. ⁷ "The Conduct of the Heart in the Face of Difficulties," BRITISH MEDICAL JOURNAL, January 14th, 1899, p. 85. ⁸ "Des Blessures du Péricarde et du Cœur," *Revue de Chirurgie*, January 10th and February 10th, 1899.

A SERIES OF CASES OF ARTHROTOMY FOR THE RELIEF OF PAIN, AND FOR REMOVAL OF SYNOVIAL FRINGES, LOOSE BODIES, AND FIBRO-CARTILAGES.

By C. B. LOCKWOOD, F.R.C.S.,

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I PROPOSE first to describe briefly several cases in which incisions were made into the wrist joint for the relief of pain, and with the ulterior hope that the progress of the disease might be arrested. My attention was first directed to arthrotomy for the relief of pain by the following case:

A woman had arthritis of the left wrist-joint. The disease had lasted for at least two months, and was accompanied with extreme pain. The cause of the arthritis had never been exactly ascertained, but my own belief is that it was due to some pyæmic infection. When the patient came under my observation she was very ill and had to keep her bed. Her temperature was raised at night, and her sleep bad on account of the pain. The wrist-joint had been kept completely at rest, but with no good result. It is clear that the wrist-joint was acutely inflamed, with considerable effusion into it. The muscles of the forearm and of the hand were wasted. The slightest pressure on the front, back, or sides of the joint caused exquisite pain. I thought at the time that in all probability the fluid was purulent, and I advised that an incision should be made to let it out, with subsequent irrigation and drainage. This was done in my presence. As far as we could judge, about 3 teaspoonfuls of fluid ran out. This was not purulent, but consisted of turbid synovial fluid. The synovial membrane was very much swollen and inflamed, but the articular cartilages were intact. The joint was washed out with antiseptic lotion and an indiarubber drainage tube inserted, and a dressing and splint applied. I was greatly struck by the way in which the pain was immediately relieved. Hardly any complaint was made after the operation. Within a week the drainage tube was removed, in another fortnight or less the wound was healed, and shortly afterwards passive movements were begun. When last I saw this patient—about three months after the operation—her wrist-joint had almost recovered, and she could use her hand at meals and in dressing herself.

The next case was a patient under my care at the Great Northern Central Hospital.

A married woman, aged 35, who was seven months pregnant, had had for three weeks an acute arthritis of the left wrist, with a high temperature at night attended with extreme pain. There was slight grating when the joint was moved, particularly towards the ulnar side. As the pain seemed intolerable and was not relieved by opiates, I thought it best, in spite of the pregnancy, to perform arthrotomy. On September 21st, 1894, under an anæsthetic, a vertical incision 2½ inches long, was made into the dorsum of the joint, passing betwixt the extensor tendons. The joint contained hardly any fluid, but the little which ran out contained minute flakes of lymph. The cartilages were intact. The joint was washed out with perchloride of mercury lotion, 1 in 2,000, a drainage tube was inserted, and a dressing of iodoform gauze and a splint was applied. On September 24th she said that the pain was quite relieved, the drainage tube was removed, and the wound shortly afterwards healed. At about the time of her confinement she disappeared from my observation, but she had ceased to wear a splint, and the joint seemed to be on the way to recovery.

In another case arthrotomy was performed for the relief of pain under the following circumstances:

A man, aged 30, jarred his left wrist-joint while striking a violent blow. Inflammation of the wrist-joint followed, which in spite of rest and most careful attention progressed. After several months the wrist-joint presented the usual features of tuberculous arthritis. This diagnosis was likewise suggested by the fact that he had had hæmoptysis, and there was dulness over the apex of the lung. The condition of the wrist seemed not quite hopeless, and a long period of rest afforded some prospect of cessation of the disease and the possibility of some amount of recovery. But it was clear, however, that the man was suffering intolerable pain. Therefore, encouraged by the result of other cases, I made a longitudinal incision about 2½ inches long into the dorsum of the wrist-joint. This allowed some starch-like fluid to escape. The synovial membrane was found to be inflamed and swollen. It seemed to me that the carpal bones had been prised apart by the inflamed synovial membrane. There was some erosion of the edges of the articular cartilages. Histological examination showed that the disease was tuberculous. A drainage tube was inserted and the wound sutured. This operation gave immediate relief from the pain, which never returned. The drainage tube was removed in 48 hours, and within 3 weeks the wound was healed. This operation was performed in the early part of 1896, and since that time the patient has been kept under observation.

On August 10th, 1896, his general health had improved. The wrist was painless, and the swelling of the synovial membrane had subsided until some of the bony points could be felt. The joint was rigid, however, and there was considerable wasting of the muscles of the forearm, but he was beginning to regain the use of his fingers, and was wearing a leather splint.

In November, 1896, the joint was quite painless although there was still considerable swelling, which felt exceedingly hard. It seemed evident that the progress of the disease had been arrested, and the joint promised to become firmly ankylosed.

Two years after the operation no alteration had taken place in the joint, which was perfectly quiet. The movements of the fingers, although much improved, were still far from perfect. However, there was no reason to be dissatisfied with the result when one considers that either amputation of the forearm or total excision of the wrist-joint had at one time seemed to be impending.

This case seems to me to furnish some clue to the intolerable pain which attends arthritis of the wrist-joint. The various small bones which enter into the formation of this joint are closely held together by dorsal, palmar, and interosseous ligaments. There is no loose capsule, so that any inflammatory effusion within the joint must soon acquire considerable pressure. Moreover, the inflamed synovial membrane may easily be squeezed between the bones, which are with difficulty thrust apart. Doubtless these are factors in producing the intolerable pain which is caused by even a small effusion of fluid, and which the patient feels when the radius and ulna or the carpal bones are squeezed together.

Arthrotomy was also performed for the relief of pain under the following circumstances:

A middle-aged woman, who appeared to enjoy excellent health and was thin and active, had suffered for four years from a severe pain in the right wrist-joint. Of late this had prevented her writing and earning her living. On examination, it was found that the pain was worse during pronation and supination, and was very acute when the lower ends of the radius and ulna were squeezed together. This pointed to disease of the inferior radio-ulnar articulation, which was confirmed by the slight swelling over the back of the head of the ulna, in the exact position of the membrana saciformis. Pressure at this point was acutely painful, and, moreover, the inferior radio-ulnar and the other carpal joints moved freely without pain. For four years all kinds of treatment had been tried, and it was clear that something radical would have to be done to relieve the pain, if not to cure the disease. A longitudinal incision was therefore made over the back of the radio-ulnar joint, and the posterior radio-ulnar ligament was divided and the membrana saciformis opened. A little turbid synovial fluid escaped. The synovial membrane was inflamed, thickened, and probably tuberculous. The margins of the articular cartilage of the head of the ulna were slightly eroded. I removed the head of the ulna because it seemed clear that osteitis was in progress. All the thickened synovial membrane was excised. The triangular fibrocartilage was not interfered with, and the rest of the wrist-joint was left intact. The incision was closed without drainage. The pain ceased after the operation. The wound healed by first intention, and she was shortly afterwards able to write and to resume her occupation. The operation was performed in December, 1895; in January, 1897, she was quite well and entirely free from pain. In April, 1897, she complained, but only for a very short time, of a pain in the joint of the pisiform bone.

This comprises all the cases that I have had in which

arthrotomy has been performed purely for the relief of pain. I need not say that on very many occasions I have had to perform arthrotomy in cases of acute septic arthritis in which pain has been present, but obviously under these circumstances the operation is not performed for the relief of the pain, but to give exit to septic or purulent fluid.

ARTHROTOMY WITH REMOVAL OF INFLAMED AND ELONGATED SYNOVIAL FRINGES.

I now propose to refer to quite a different type of disease affecting the knee-joint:

A married woman, aged 30, came under my care on account of her left knee-joint. For about six years she had had repeated attacks of synovitis, which occurred whenever she walked for a mile or two, or when any unusual effort was made with the limb. Of late the swelling and inflammation of the joint had been almost continuous, but was said to have subsided during a period of absolute rest. When I saw her she was lying in bed with the knee-joint completely extended. There was very little wasting of the muscles of the calf or thigh. The temperature of the joint was slightly raised. It contained fluid, and swollen synovial fringes could be felt, especially around the lower end of the femur. Although no loose body had been discovered in the joint, nevertheless as she was unable to perform her household duties, and threatened to become a chronic invalid, it seemed reasonable to explore it, and endeavour to ascertain the cause of the repeated attacks of synovitis. It was opened by an incision down the outer side of the patella and ligamentum patellæ. No loose body could be found in any part, although all the pouches both above the patella and in the regions of the condyles were thoroughly searched. The joint contained about half an ounce of synovial fluid, and all the synovial fringes, especially along the edge of the ligamenta mucosa and alaria, were inflamed, swollen, and greatly elongated, many to at least five or six times the usual size. The rest of the synovial membrane was inflamed, but not markedly thickened. The cartilages were healthy, except at the edges, where in places they were slightly thickened, which may have been the commencement of the formation of osteophytes. The cartilage had been slightly absorbed where the fringes of the ligamenta alaria had been in contact with it. I proceeded to systematically remove all the enlarged synovial fringes by seizing them with forceps and cutting them off with a pair of curved scissors. The incision allowed this to be done properly throughout the outer half of the joint, but to get at the inner the ligamentum patellæ was divided. The whole of this proceeding was attended with very little hæmorrhage, and such as there was was readily staunching with a little hot lotion. The ligamentum patellæ was united with five or six buried sutures of stout silk worm gut. The incision into the joint was then closed in the usual manner, and an indiarubber drainage tube was inserted, and a dressing applied. The limb was placed upon a Macintyre splint. On the night of the operation some pain was complained of, but not afterwards. The drainage tube, which was put in to give exit to blood and synovial effusion, was removed at the end of forty-eight hours, and the wound healed by first intention. The operation was performed on August 15th, 1898. I saw the patient again in May, 1899. She was then able to walk about, and to perform her household duties. She said the knee was better than it had been for years. The movements were good and painless. The ligamentum patellæ had united. The joint contained no fluid, but I thought that the synovial membrane was still a little swollen.

I wish to make two remarks upon this case. First, it is to be greatly regretted that the fringes were not submitted to proper histological examination. I requested that one should be made, but unfortunately they were destroyed in error. Little is known about the pathology of this so-called villous synovitis. I came to the conclusion, however, that the disease was not tuberculous, and not at all like osteo-arthritis. Secondly, as regards the way in which the joint was opened; the transverse incision through the ligamentum patellæ did not give a good exposure of the whole interior of the joint, and afterwards I found that the ligamentum patellæ was not very easy to suture. Its fibres tear apart, and permit the sutures to draw, and it is not very easy to get the cut surfaces into exact apposition. On the whole, I am inclined to think that it would have been better to have sawn through the patella. Arthrotomy was also performed for the removal of a synovial fringe under the following circumstances, although an exact diagnosis was not made, but something could be felt projecting at the inner side of the ligamentum patellæ.

The patient, a girl aged 17, three months before had sustained an injury to her right knee whilst trying to get upon a horse. Since then the joint had suddenly given way on several occasions, and this had been followed by effusion, and some discoloration of the skin, which suggested extravasation of blood. The projection at inner side of the ligamentum patellæ was exceedingly tender and to my mind was rather more painful than a displaced semilunar cartilage. When the joint was opened it was found to be a part of the internal alar ligament, much thickened and elongated, and cartilaginous-looking at its edge. It had to be pulled from between the condyle of the femur and the tibia, and there seemed little doubt but that it was the cause of the trouble. This fringe was cut off with a pair of scissors, and the slight bleeding was easily arrested without the use of any ligatures. The joint was closed in the usual way. A speedy recovery ensued, but I have hitherto been unable to learn the ultimate result.

ARTHROTOMY IN CASES OF CHRONIC OSTEO-ARTHRITIS.

In cases of osteo-arthritis it not unfrequently happens that

the synovial fringes detach themselves after having become laden with cartilage or bone. The usual results follow. The patient is apt to be suddenly thrown to the ground when a loose body slips between the articular surfaces and an attack of synovitis then ensues. Sometimes the pedicle of the enlarged fringe elongates so that it has a considerable range of movement and can sometimes intrude betwixt the articular surfaces and thus the same effects are produced as if the fringe had been actually loose. My earlier operations upon these cases of osteo-arthritis were performed with some degree of trepidation. It seemed reasonable to suppose that a good deal of stiffness might follow, especially as the operation necessitated a period of complete rest, and this foreboding was partially realised in one of the cases.

A lady, aged 70, who was under the care of my friend Dr. Malcolm, had advanced osteo-arthritis of her knees with considerable lipping of the cartilages, and in the right some loose bodies. Of late these had frequently got between the articular surfaces, and a few weeks before the operation she had been thrown down whilst walking downstairs; latterly she could not walk downstairs at all without the joint locking and an attack of synovitis resulting. An incision was made into the joint parallel to the edge of the patella, two loose bodies were extracted, and two others with long peduncles were cut off the femur and removed. The operation was performed on April 26th, 1896, and on May 7th the old lady was walking about without any catching or stiffness of the joint.

Another patient, who was under the care of Dr. Kisch, was also operated upon for the removal of pedunculated cartilaginous fringes due to osteo-arthritis. In this case a large pedunculated fatty growth of the synovial membrane was likewise taken away. Both knee-joints gave evidence of considerable osteo-arthritis. Enlargement of the fringes, lipping of the edges of the bone, and grating on movement were very marked. In addition loose bodies could be felt in the right knee and seemed to disappear under the patella, where they occasionally got nipped. In consequence the joint was very insecure and on several occasions it had given way in the midst of traffic, so that the lady had nearly been run over. An incision was made along the outer side of the right patella and two pedunculated cartilaginous fringes removed from the upper condyle of the femur. The pedicles were so long that they easily passed beneath the patella, and they could probably have passed between the tibia and the femur. The joint was thoroughly explored with the finger, no more cartilaginous bodies were discovered, but only the fatty growth in the outer recess of the suprapatellar pouch. The growth was removed with scissors. The operation was followed by little pain and only a slight attack of synovitis. Within a month she was walking about with exceedingly good movement in the joint and entire freedom from the giving way or insecurity.

On October 24th, 1896, I operated on an elderly man to find a loose body which could occasionally be felt, but it was so difficult to secure that for some days before the operation we were quite unable to find it. The knee-joint was opened by an oblique incision into the superior internal synovial pouch. At first the loose body could not be found, but was felt at last near the outer side of the external condyle. It slipped about with such facility that the finger chased it about the inside of the joint, where it kept catching in various pouches. However, the operation was followed with hardly any pain or discomfort, and by only a very slight attack of synovitis. The wound was dressed on November 8th, and was found to be healed. There was hardly any fluid in the joint, and in a very short time the patient returned to his work.

Whilst operating on this and other cases I have been rendered sceptical as to the truth of the statement which is often made that the knee-joint will contain more fluid when it is flexed than when it is extended. I myself have found it almost impossible to get my finger into the flexed knee because the extensors are so exceedingly tight. On the other hand, when the joint is extended it is quite easy to pass the finger around its interior, except of course behind the condyles. Moreover, when the knee is extended blood and fluid are apt to collect within it, but are easily squeezed out by forcibly flexing the joint.

The last case was one in which the operation of an osteo-arthritic joint was followed by stiffness.

The patient was a stout middle-aged woman with marked osteo-arthritis of both knees, especially of the left. The enlarged synovial fringes were easily felt. She gave the usual history of the left knee-joint suddenly giving way with a subsequent attack of synovitis. The pain was referred to the outer side of the patella, where a loose body could be felt. A longitudinal incision was made into the joint half an inch from the patella, and a loose cartilage three-quarters of an inch in diameter and one-third of an inch in thickness was removed. It was attached to the inner edge of the external semilunar fibro-cartilage by a long pedicle which had to be cut through. It is clear, however, that the joint contained many inflamed, elongated, and enlarged synovial fringes. The operation was done on October 28th, 1893, and the wound was dressed on November 6th, when, although the joint was perfectly quiet, and the upper part of the wound healed, nevertheless there was slight suppurative at the lower end of the wound. This necessitated a rather longer sojourn in bed and the limb to be kept longer upon the splint. However, the splint was removed and massage begun on November 24th, rather less than a month after the operation, and she went home on December 18th. She walked better than when she came in, and she had no pain. Nevertheless, there was a degree of stiffness in the joint, which, in my opinion, greatly detracted from the result. Of course it is most important to know when this is likely to occur before the operation is undertaken. Therefore it is not uninteresting to note the kind of joint I had to deal with. Before the operation the left knee was hot and measured one inch more in circum-

ference than the right. The left patella was irregular, and half an inch wider than the right. There was marked lipping of the femur and tibia. Movement was nearly painless except in extreme extension, which probably nipped the loose body. All movements were attended with much grating. Thus it is clear that this was a case of osteo-arthritis in which there was a very great tendency to the growth of osteophytes. I saw this patient some months after she had left the hospital. She walked about and did her household duties, but attempts to move the joint caused considerable pain. Unfortunately she possessed little fortitude, and had a decided repugnance to any form of treatment which caused the slightest pain. She was advised to have an anæsthetic and manipulation such as is usually applied to joints that are stiff from osteo-arthritis, but for domestic reasons she was unable to have this done.

Evidently operations are to be avoided in cases of osteo-arthritis of this description. Should an operation be required on account of derangement with subsequent effusion it might be better never to put the limb upon a splint and to commence movement at the earliest possible moment.

ARTHROTOMY FOR EXCISION OF INTERNAL SEMILUNAR FIBRO-CARTILAGE OF THE KNEE.

I now propose to refer to some cases in which the knee-joint has been opened for removal of the internal semilunar fibro-cartilage for various derangements. The first has already been described.¹

I had a message from the patient four years after the operation to tell me that he considered the knee-joint to be perfectly well. Unfortunately I have been unable to see him recently, but two years and a-half after the original operation he was under my care for another complaint, and with the exception of the scar the joint was normal; he stated that he never had to consider it, and that it was as good as the other. The semilunar fibro-cartilage had been displaced at football; afterwards it was wont to get displaced under all kinds of circumstances. No projection could be felt, but the internal semilunar fibro-cartilage seemed rather loose. When the joint was opened it was found that its anterior extremity had been broken away from its attachment in front of the spine of the tibia, and the outer edge torn from the tibia by rupture of the coronary ligament, so that its anterior end projected and moved about freely within the joint. This part of the fibro-cartilage looked crumpled up, and there was nothing to prevent it from becoming caught between the femur and tibia. All this detached portion was cut off with scissors, and the remaining part was sewn down to the upper end of the tibia with a strong twisted silk suture.

I have mentioned the case because the history is carried down to four years after the operation.

The following case has never been published before.

On April 16th, 1894, I opened the left knee-joint of a young gentleman under the following circumstances. Some months before, whilst in British Columbia, he noticed that something occasionally slipped within the joint, which became for the time locked and useless. This accident was followed by an attack of synovitis. He might have been content to endure his condition, but one day he was shot out of a canoe into the Fraser river, and as soon as he began to swim the knee-joint became locked, and he said that he was very nearly drowned. By flexing his knee and rotating it he could make a projection appear at its inner side. By continued flexion and by manipulation with the thumb this could be pushed back with a click. The knee-joint was opened on April 16th, 1894, with the usual longitudinal incision; the front part of the internal semilunar fibro-cartilage had been detached from the tibia, and projected between the condyles of the femur. It was seized with pressure forceps, dragged as far as possible out of the joint, and cut off with a pair of sharp-pointed curved scissors. As far as could be judged, at least the anterior two-thirds of the fibro-cartilage were excised. The joint was closed in the usual way with four or five fishing-gut sutures. It was dressed on April 26th, when the stitches were removed. This was followed by slight gaping of the skin incision, so that in all subsequent cases I have been rather more cautious in removing the sutures. I have never removed them before the eighth or tenth day, and then only taking out alternate sutures. However the wound rapidly healed without suppuration, and he was walking about within a month. In June he was dancing and riding, and in September he wrote to say that he considered himself quite cured. He returned to British Columbia, but came back in February, 1897, very nearly three years after the operation. With the exception of the scar the knee-joint was normal. He led a most active life, and stated that he considered the joint as good as the other, and quite perfect despite the absence of the fibro-cartilage.

I have since removed the internal semilunar fibro-cartilage in two other cases. In both of these it appeared as though a great elongation of the coronary ligament permitted it to slip forward, so that its thick posterior edge got betwixt the condyles of the femur and the tibia. One of these cases was unusual from the fact that the patient was a female in whom such derangements seem to be rare. However she followed the vocation of prison wardress, so that she was more exposed to violence than females usually are. She had attacks of locking and pain for many years; pressure upon the internal semilunar fibro-cartilage caused great pain. At the operation it was found to be exceedingly loose and displaced forward, so that its anterior two-thirds were cut away. I myself should have preferred to have removed the whole cartilage, but I cannot honestly say that I have quite succeeded in accomplishing this, and have not found out any way of dragging the whole of the posterior part away from the back of the tibia

where it is attached. In this case the movements of the joint were not recovered quite as rapidly as usual, and full extension was painful for some weeks. I could not help thinking that the piece of cartilage which had been left behind might have had something to do with this. Under nitrous oxide gas the movements were quite free and perfect. On December 12th, 1898, she came to report herself. She had returned to her duties. She said her joint never slipped or locked, and the movements were perfect, and she walked without a limp. I have recently seen this patient. Although she can run downstairs, she says the joint "sticks half-way" if she walks down. It is, however, gradually improving.

I have recently operated upon a gentleman whose internal fibro-cartilage was also displaced, with great elongation of the coronary ligaments. The operation was so recent that I am unable to give any account of the ultimate result.

REFERENCE.

¹ *Clinical Society's Transactions*, vol. xxvii, 1894, p. 133.

ON LATERAL CURVATURE OF THE SPINE: ITS PREVENTION AND TREATMENT.

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III.

THE two papers on this subject already published deal with four deviations of the pelvis, and with the means proper to correct them; some, though not a large, proportion of parents are astute enough to observe these conditions while still nascent, careful enough to forebode the possibility of resultant evil, and to seek advice that may enable them to prevent it. Many, on the contrary, do not notice the malpostures, or, if they do, regard them erroneously as simply harmless tricks which the child will "grow out of," and therefore they let matters go on till curvature more or less marked disturbs this ill-founded security. Thus it has fallen to my lot to have seen many cases in varying degrees of pelvic deviation (simply) of commencing and of advanced curve. These compared and contrasted with one another present several series of connected clinical observations showing the development from pelvic deviations of lumbar, total, and S-shaped curves. The relationships between the different forms of the former and of the latter is as follows:

1. *Permanent Pelvic Obliquity* produces primarily a lumbar curve, convex towards that side on which the pelvis is lowest—that is, towards the side of the shorter limb; the curve is commensurate with the degree of pelvic slope, and remains, if this be small, simply lumbar; if it be considerable, the curve encroaches pretty high into the dorsal region, even it may after a time develop into an S-curve, while strongly marked obliquity, such as is shown in Fig. 1 of my previous paper, is followed pretty quickly and certainly by that last-named form of curvature.

2. *Habitual Obliquity* does not produce more than a lumbar or a long and gradual total curve.¹ This depends not only on the fact that such obliquity is less severe than many cases of the permanent variety, but also on its greater inconstancy and variability.

3. *Amesiality* causes curvature in a direction contrary to the pelvic deviation—that is, pelvic amesiality to the right is accompanied by curvature to the left, and *vice versa*, it is usually total *ab initio*. After a time, especially if the pelvic defect be strongly marked, this curve also assumes the S-form, but the change is delayed, although when it sets in it is rather rapid.

4. The curves produced by pelvic version are in a different category, and here I must correct and apologise for a blunder in the first paper of this series, which to me is unaccountable, unless it occurred in compressing while copying the second paragraph of that MS. The statement there is that version of the pelvis is followed by lumbar or total curve; it should of course have been double or S-shaped curve. The explanation of this fact, as corrected, is not far to seek. Version (let me assume it to be to the left) connotes twisting of the spine, that is, save for a compensating posture now to be described, of the whole figure which thus stands slantwise on the feet; but