high tension in some cases, just as I have previously stated that it is a cause of some headaches, of some epileptic fits, and of some mental depression or melancholia; but it must be left to the future to show in what proportion of these disorders it is the active agent, as well as to confirm or refute the facts I now bring forward.

I will now say a few words about some of the conditions of the prealbuminuric stage of chronic nephritis mentioned by the late Dr. Mahomed, which are of most interest to me, and some of these I have mentioned in previous papers.

Cold Hands and Feet.—These are very marked in myself at all times, but more especially during a headache, when it often seems to be impossible to get the feet warm by anything short of sitting with them in hot water, and where this can be done it gives some relief to the head. It seems to me that we have at this point very interesting connections with Raynaud's disease, if not, also, with paroxysmal hæmoglobinuria.

Imperfect Digestion, Bronchitis, and Gastric Catarrh.—Dyspepsia, I have no doubt, has important relations to uric acid, and some of these I have pointed out in previous papers; but if retention of uric acid produces, as I am inclined to believe, congestion of the liver, it may by this means produce portal congestion and gastro-intestinal catarrh. Headache, especially hemicranial, loss of memory, depression, weariness, cloudiness of intellect, and hypochondriasis are among other symptoms mentioned by Dr. Mahomed, and I have already said that I believe I can produce most of them by influencing uric acid.

With regard to kidney disease, bronchitis, gastric and other catarrhs, Dr. Mahomed says,[16] "I have tried to show that a poisoned condition of the blood is the primary condition—the bad blood produces a congestion of the excretory organs, that is, of the skin mucous membranes and kidneys;" and I am now attempting to show that uric acid in the blood will produce many of the symptoms he mentions.

In conclusion, I would express my very strong conviction that when the headache known as "migraine," "bilious headache," or "sick headache," is associated with a pulse-tension which is notably higher than that of the same individual in his ordinary health, such headache and high tension of the pulse are due to excess of uric acid in the blood, and will be found, on examination, to be contemporaneous with its excessive excretion in the urine, and may be cured or prevented by diet or drug treatment directed to the removal from the blood of such excess of uric acid.

The cases of epilepsy which Dr. Broadbent[17] has pointed out as being associated with chronic high-tension pulse, and as very amenable to treatment by a milk diet, are, I should think, in all probability due to uric acid.

In addition to the case of epilepsy mentioned in the *Neurologische Centralblatt*, March 1st, 1888, I have found uric-acid reactions in all cases of epilepsy I have been able to examine with sufficient care, though these are as yet very few in number; but in no case have I found a high-tension pulse at the time of the fit, though I have found it in many very fairly marked between the fits. I think, however, that very probably the exertion and struggling in the fit have been sufficient to quicken the pulse and remove the signs of high tension, at least to the finger,[18] though I should expect that a trace taken after a fit would show more signs of tension than a trace of the pulse in the same individual under normal conditions and quickened by exertion to the same rate, and I shall take the first opportunity of testing this point. With regard to mental depression associated with high tension, I feel just as confident of the causation of both by uric acid, as I do in the case of headache, for both these conditions I can produce and cure at pleasure in myself and others, and it is easy to say when they are present and when they are absent; but epilepsy presents in both respects a much more difficult problem, as the fits give little or no warning of approach or cessation. I have, however, met with several interesting cases where fits apparently occur only during a sick headache, and similar cases are recorded by Dr. Liveing[19] and other observers, and many points mentioned by Dr. Broadbent are of great interest in this connection.

I conclude from the facts, some of which I have given in this paper, (1) that, *cæteris paribus*, arterial tension varies with the amount of uric acid that is circulating in the blood. (2) That (as I have said in previous papers) when the uric acid in the urine bears a greater proportion to the urea excreted along with it than about 1 to 33 (1 of uric acid to 33 of urea), there is some excess of uric acid in the blood, of which the excess in the urine may be regarded as an index. I would here remark that my supposed normal relation of uric acid to urea (1 to 33), as given in previous papers,[20] is nearly midway between the relations of these two substances found by MM. Yvon and Berlioz,[21] their first published relation being 1 to 30, and their second 1 to 40; and practically I do not regard as abnormal relations coming between 1 to 30 and 1 to 36. (3) That it follows from the above that as I am able to vary the excretion of uric acid to a considerable extent at will, I am also able to cause alterations of arterial tension in either direction.

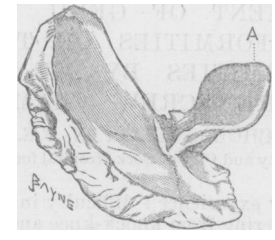
The high pulse-tension of headache has been noticed by Dr. Liveing and others, and that of melancholia by Dr. Broadbent. I have in previous papers suggested that both these disorders are in some cases due to uric acid, and I now make the further suggestion that the high tension is also due to uric acid, and may be controlled by altering the amount of it in the blood.

[16] *Loc. cit.*, p. 365.
[17] Croonian Lecture, No. III, 1887.
[18] See previous remarks on Trace No. 2.
[19] *Loc. cit.*

EXCISION OF THE INTERNAL SEMILUNAR CARTILAGE, RESULTING IN PERFECT RESTORATION OF THE JOINT-MOVEMENTS.

By THOMAS 'ANNANDALE, F.R.C.S.,
Regius Professor of Clinical Surgery in the University of Edinburgh.

THIS case, which closely resembles the very successful one described and shown to the Clinical Society of London by Mr. Croft on March 9th, 1888, is an additional proof that one or both semilunar cartilages may be removed without interfering with the after proper movements of the joint, as stated by Professor Kocher. The condition of the excised cartilage in the case presently to be recorded is illustrated in the wdoocut; and in addition to the tongue-like portion of it (see A), which had been



partially torn away, the body of the cartilage itself was thickened and undergoing a form of fatty degeneration. Had the cartilage been healthy I should have confined the operation to the excision of the projecting portion.

I think it may be fairly said that operative interference in connection with injured or diseased semilunar cartilages has now become an established procedure; and since my first case, operated upon on November 16th, 1883, and recorded in the JOURNAL for April 18th, 1885, and February 12th, 1887, additional and successful experience has been recorded by myself and by other surgeons. Six weeks ago I operated upon a case in which the attachments of the internal semilunar cartilage were so separated as a result of an injury that the cartilage was doubled up in the joint like a piece of folded cardboard. I was able to bring it into proper position, and by means of four catgut stitches to secure it so. This case has progressed without the slightest bad symptom, although the operation was a somewhat tedious one and the joint surfaces freely fingered, and the patient is now walking with a perfectly movable joint.

Further experience of these cases has confirmed my opinion that no mechanical appliances will cure cases in which the semilunar cartilages are much separated from their attachments or otherwise seriously injured. Such appliances may, by limiting the movements of the knee-joint, allow a patient to walk more

[20] See *M. D. Thesis*, previously referred to.
[21] *Rev. de Méd.*, September, 1888.

or less stiffly and to bear weight upon the limb as long as they are employed, but such a means of palliative treatment cannot be compared to the successful and permanent result obtained by a suitable operation.

CASE.—R. U., aged 38, a strong, healthy miner, applied to me at the Royal Infirmary on July 11th, 1888, for advice in connection with the result of an injury to his left knee. His history was that he had enjoyed excellent health, but eleven months previously, when at his work, a mass of coal fell upon his leg and knocked him down. In his struggles to get up he gave his knee a severe twist, and it was with some difficulty that he got home. He did not use any treatment, but the joint was swelled and stiff for some days. He returned to light work, but found that the movements of the joint were uncertain, and that sometimes it would suddenly become "locked." During the last few months the interference with the functions of the joint had become more frequent, and he began to feel something "moving" in the joint, and when the knee became fixed it required some little manipulation to restore its movements. As he was unable to work properly at his employment, he was very desirous to have something done to relieve him. An external examination of the joint did not detect any unnatural condition, except that there was a slight effusion into its cavity. At times the movements of the joint were free, but during some action of the limb the knee would become fixed, and give rise to pain over the region of the internal semilunar cartilage, until manipulation had unlocked the articulation.

On July 18th I exposed the affected cartilage by my usual incision,[1] and the joint having been freely opened, the condition illustrated in the woodcut was seen. I then excised the greater part of the cartilage, a small portion of its posterior margin being left, as it could not be easily reached. No drainage was employed, and the patient made a perfect recovery, the temperature chart showing that during his progress after the operation his temperature never rose above 99.3° F. He left the hospital well upon August 16th, and was advised to commence careful movements of the joint. The patient returned to show the result of the operation in December, and it was then found that the joint-movements were quite natural, and he was carrying on his employment successfully.

THE TREATMENT OF GENU VALGUM AND OTHER DEFORMITIES OF THE LOWER EXTREMITIES BY MEANS OF THE SCREW CLAMP.

BY NICHOLAS GRATTAN, F.R.C.S.ED.,
Senior Surgeon County and City of Cork Hospital for Women and Children.

HAVING frequently experienced difficulty in remedying deformities of children suffering from knock-knee and bow-legs by means of the usual methods, and being unwilling to resort to the operation of osteotomy, it occurred to me that it might be possible, by rapidly breaking the bone at the wished-for spot, to rectify the deformity. I concluded that if the bone could be broken without injury to the epiphysis, I should have to deal with a simple fracture which would run its course without complication, and that little harm could result to the soft parts from the pressure, provided it was not of long duration, care being taken not to press on any important vessel or nerve. For this purpose, after many experiments, I had the clamp depicted manufactured. It consists of two curved arms, which can be approximated or separated as may be wished. These are covered with thick india-rubber, and are connected by means of a strong pivot. Attached to this pivot is the screw, into one end of which is fitted the appliance for making pressure, the other end terminating in a strong handle. This arrangement of the arms and of the screw, connected by a pivot, admits of pressure being applied at any point, and counter pressure at any two points that may be desired. Underneath this pivot is a nut, by means of which the arms and the pivot can be firmly screwed together.

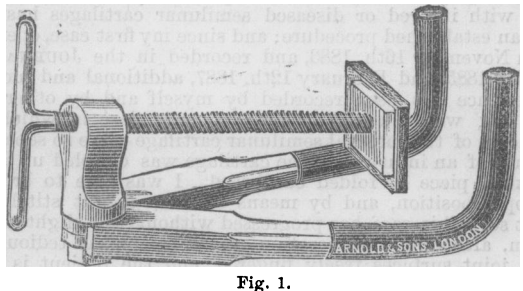


Fig. 1.

In operating on a femur for genu valgum, in order to break it, a wedge-shaped appliance with rounded edge of polished steel is fitted to the screw. One curved arm of the clamp is placed on the outside of the femur just above the epiphysis, the other arm four or five inches higher up the limb. The screw with the wedge is applied two or two and a half inches above the condyle, on the inner side of the bone. Having decided upon the exact position of the points of pressure, the clamp is removed from the limb, and must be firmly screwed together by means of the nut which is on the under side of the clamp. A wrench for the purpose is supplied by the makers. The clamp having been reapplied in the desired position, which has been previously marked on the limb, must be carefully held there by an assistant; the screw must be quickly and forcibly turned, compressing the wedge in on the bone, and generally in about twenty or thirty seconds it will be heard to break at the point of pressure; should it not do so, at this moment a slight quick jerk of the leg inwards will complete the fracture. Care should be taken that no force be used which would tend to injure the external lateral ligament.

For bow-legs I use a flat appliance, which is covered with felt or india-rubber. The clamp having been applied to the limb, the bones are forcibly pressed into the wished-for position.

In the cases I have operated on, I was surprised at the very small amount of injury inflicted on the skin. After the third day, with one exception where the skin got entangled, but slight ecchymosis remained at the points of pressure. All my cases ran the ordinary course of simple fracture.

I do not pretend to recommend the indiscriminate adoption of this method of cure for genu valgum. I have not yet operated on any child over 12 years, but I shall endeavour to do so should I have an opportunity. When the patient's age exceeds 12 years, the great amount of pressure required to break the bone becomes a matter for serious consideration.

Since my last operation (on E. B.), the steel pressure appliance has been increased in length, and I do not expect any further trouble such as I had in her case. From all I can see, I believe this operation for genu valgum, in trained hands, will obviate the necessity for osteotomy in many cases. An experienced assistant who has learned to work with the operator is also very necessary. The following is the history of the patients upon whom I have already operated.

M. L., aged 3 years, admitted November 16th, 1887, an ill-nourished child. Both legs were badly bowed at lower third; the outer ankles touched the ground when she attempted to walk.

December 3rd. Fractured left tibia and fibula with a screw clamp, using felt pads at the points of pressure; put up the limb quite straight in a pasteboard splint, having enveloped it in Gamgee tissue.

January 31st, 1888. Left leg rapidly recovered as an ordinary simple fracture; now quite straight. Fractured right tibia and fibula to-day, using the same clamp, and having straightened the limb, put it up in the same manner as the left leg.

April 6th. Right leg quite united and straight. Patient dressed and up; stood with the assistance of a chair.

September 22nd. Had been in the country for five months, was much improved in health; limbs quite straight; could walk holding on to the nurse's hand.

J. K., aged 3½ years, admitted June 5th, 1888, suffering from bow-legs. He was a patient of Dr. Ashley Cummins, who kindly asked me to operate.

June 6th. I fractured in the lower third, and straightened the right leg, which was treated in the same manner as my first case.

June 20th. Fractured and straightened left leg.

July 26th. These fractures having united without any trouble, the patient was discharged cured to-day.

M. S., aged 11 years and two months, always suffered from

[1] I still prefer this incision, but if the cartilage is not sufficiently exposed in this way, I have sometimes also made a short incision downwards from the centre of the first one.