CONCLUSIONS.

In acute septic conditions of the uterus I am of opinion:

1. That careful treatment of the endometrium and draining the cavity of the uterus does not produce an extension of the existing inflammation but lessens it.

2. That the cavity of the uterus can be approached time after time until the temperature becomes normal, the uterus firm, and the discharge is got rid of.

3. That inflammatory conditions in the adnexa of the uterus are not only no bar to but are an indication of the need for treatment of the endometrium, since the centre of the infection must be therein. This is proved by the fact that the physical signs subside much more rapidly when the uterus is drained than if left alone.

4. That in a large number of cases the origin of the pain and discomfort lies not in the tubes but in the uterus, because it is inflamed and heavy.

5. That unless these lesions outside the uterus are of the grossest kind no operation should be performed, at any rate until thorough methodical treatment of the endometrium has first been tried. Exacerbations of salpingitis have proved far less frequent since I have followed this line of treatment.

I have to thank Dr. Robert Donaldson for the assistance he has rendered me in the bacteriological examinations, and Drs. A. D. Morris and M. J. O'Brien for their loyal help in carrying out my treatment.

THE INTRAVENOUS ADMINISTRATION OF CALCIUM ACETYL SALICYLATE.

BY

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A CONSIDERATION of the many conditions in which acetyl salicylic acid may be successfully employed shows that it possesses both antipyretic and analgesic properties. In acute rheumatism and other acute febrile diseases it frequently has a marked action as a febrifuge, and if given in the very early stages of influenza it often appears to cut short or abort the attack. It is an anodyne and a sedative in most painful conditions, and it is popular with the lay public because it sometimes relieves headache and neuralgia.

Stockman¹ states that the analgesic action of acetyl salicylic acid can only be explained by supposing that part of the drug is absorbed unchanged into the blood stream; Cushny² states that part is decomposed into salicylic acid, that part is absorbed unchanged, that the salicylate formed from it exercises its usual action in the tissues, and that there is a further action in headache and neuralgia attributable to the absorption of unchanged acetyl salicylic acid. It appears therefore that acetyl salicylic acid has two separate actions, one being antipyretic and produced by the salicylate content, and the other analgesic and due to the unchanged drug. It occurred to me about a year ago that the analgesic action might be greatly increased if the drug were injected into the blood stream by the intravenous method. I have been unable to find any account of its having been done before.

Acetyl salicylic acid itself is only very slightly soluble in water, but the calcium compound dissolves in water, one part in six. Given by the mouth, its action resembles that of acetyl salicylic acid. The solution has a pinkish tinge and a slight acid reaction to litmus, 1.7 c.cm. of decinormal sodium hydrate completely neutralizing 0.5 of the drug. The solution can be boiled without any chemical alteration. The first samples I used were taken from the powder intended for oral administration. It had a strong smell of acetic acid, and had a marked acid reaction to litmus. I gave only two or three injections of 0.1 gram, as I did not like to give larger doses of such an acid substance. Messrs. Martindale then supplied me with their preparation of tylcalsin in 0.5 gram compressed tablets made without the use of wax or theobroma (substances used to prevent chemical action by atmospheric moisture). The following notes on cases illustrate its action.

1. *Tabes Dorsalis*.—A man, aged 43, had severe lightning and girdle pains. He had had a prolonged course of antisyphilitic treatment with arsenical compounds and mercury; he also had seven intraspinal injections of mercurialized serum, with a diminution of the pains a few days after each injection, but with no lasting benefit. Acetyl salicylic acid by the mouth eased the pain to some slight extent. I then gave him 0.25 gram of calcium acetyl salicylate on September 2nd, 1920, 0.5 gram on September 3rd, and 0.75 gram on the following day. Three days later, on September 7th, he reported that he had no pain in the legs, but pain in the abdomen was severe. On September 21st I gave him 0.75 gram, and on September 28th 1 gram, and he stated that the pain became much easier. On October 5th I gave him 1 gram calcium acetyl salicylate, and I saw him again on the 9th, when he had been at work since the last injection and had had only slight occasional pains. Since that date he has had 1 gram every month, and is practically free from pain.

2. *Tabes Dorsalis*.—A woman, aged 40, complained of severe lightning and girdle pains. She had had a prolonged course of arsenical compounds and mercury, and although it had improved her general condition and ataxia to some extent it had not relieved her pains. Intraspinal injections of mercurialized serum produced intense reaction with relief of her lightning pains for some days afterwards. On October 18th she complained of severe headache and girdle pains, and I gave her 0.25 gram calcium acetyl salicylate. On October 20th she reported that she had had no pains, since the injection, but on November 24th she complained of severe girdle pains again, and I gave her 0.5 gram calcium acetyl salicylate. On December 1st I gave her again 0.5 gram, and when I saw her on January 17th she reported that she had been free from pains until a few days before. I again gave her 0.5 gram of the salicylate, and when I saw her on February 2nd she had been free from pains since the last injection.

3. *Interstitial Keratitis of the Left Eye*.—A boy, aged 12, suffering from interstitial keratitis, had been given seven injections of 0.2 gram kharsivan and thirteen injections of 0.2 gram novarsenobillon intravenously, with twenty injections of mercurial cream in half-grain doses intramuscularly, between May 31st, 1917, and January 1st, 1918. On February 24th, 1921, he again attended with a fresh attack of interstitial keratitis of the left eye, with much ciliary injection, ocular tenderness, and photophobia. He was given 0.2 gram calcium acetyl salicylate, and on the 26th the ciliary injection was much less and the pain much easier. On that day he was given 0.3 gram calcium acetyl salicylate, and on March 1st, when he was seen again, he stated that he had been quite free from pain for forty-eight hours after the injection, but the pain returned slightly after that. He was given 0.3 gram calcium acetyl salicylate, and by March 3rd there was slight photophobia still, but all the ciliary injection had practically disappeared, and when seen again on March 5th the eye was quite well.

4. *Acute Gonococcal Iritis*.—A man, aged 32, had had gonorrhoea five years ago, and had been previously treated by myself in 1919 for an attack of acute gonococcal iritis, which lasted nearly three months. Ten grains of aspirin had always given him relief from the pain for a few hours. In July, 1920, he had a fresh attack in the same eye and was treated for two months in France. In September, 1920, he came to me, when he had all the acute symptoms of iritis, and the condition appeared to be as far from recovery as ever. He had photophobia, severe ocular tenderness, and supraorbital pain. On September 25th I gave him 0.2 gram calcium acetyl salicylate, and he then had relief from pain for about ten hours, and although his symptoms returned they were not in any way so severe as before. On September 27th I gave him 0.4 gram, and on the 28th a similar dose of calcium acetyl salicylate; all pain and tenderness then disappeared and the ciliary and conjunctival injection began to clear up at once. When I saw him again on October 11th he was quite well and the instillation of atropine was stopped. Since then there has been no relapse.

5. *Arsenical Neuritis*.—A woman, aged 41, who first attended on August 25th, 1920, had seven injections of novarsenobillon intravenously, the last one being given on October 20th, 1920. She then had four injections of 0.6 novarsenobillon at weekly intervals, from December 1st to 22nd, 1920. I saw her on January 19th, 1921, when she reported that she had severe pains in the arms and legs, extending downwards to the fingers and toes, apparently due to arsenical neuritis. Potassium bromide gr. xx and aspirin gr. x at night were given with no relief. On February 2nd she was given 0.5 gram calcium acetyl salicylate intravenously. On February 9th she reported that her pains had disappeared one hour after the injection and they had not returned; she has been free from pain since then.

In three other cases of tabes dorsalis intravenous injections of calcium acetyl salicylate produced equally good results. In five cases of gonorrhoeal synovitis, in which the knees, shoulders, and ankles were affected, pain was almost immediately relieved and the swelling began to go down after the first injection. The dose given was 0.5 gram every second or third day. In one case of synovitis of both knees the patient, after the first injection of 0.5 gram, was able to carry on his work as a motor driver. After seven injections given at intervals of three days, his knees were quite well with the exception of slight puffiness of the capsules of the joints, which

disappeared two to three weeks afterwards. In three cases of longer duration, although the injections relieved the pains the synovitis appeared to run its usual course. In one case of acute rheumatism with multiple synovitis and high temperature, while each injection was followed by a lowering of the temperature and relief of pain for some hours, no curative effect resulted, and the progress of the disease appeared to be unaltered. She had been given sodium salicylate up to the point of causing deafness and noises in the ears and sickness, without any relief of pain.

The technique is simple: a 1 gram tablet is dissolved in 10 c.cm. of distilled water by boiling in a test tube in order to ensure sterilization; the solution is then cooled and injected into the vein with a glass syringe. It is advisable to inject slowly to allow the solution to mix gradually with the blood stream in order to prevent thrombosis. I have now treated a diversity of painful conditions where other remedies have failed to bring alleviation. They include sciatica, acute rheumatism, tabes dorsalis, interstitial keratitis, acute iritis, gonorrhoeal synovitis, arsenical neuritis, dysmenorrhoea, and severe headache of doubtful causation. In all 55 cases have been treated. Pain is relieved in half to three-quarters of an hour and the effect persists for several hours and in some cases for days. In one case of acute rheumatism the patient was unable to take sodium salicylate and aspirin by the mouth on account of gastric irritation. Daily injections of 1 gram of calcium acetyl salicylate produced complete freedom from pain for about six hours. For adults the dose usually given is 1 gram.

In no case has there been the slightest ill effect. Following a personal experimental injection of 0.5 gram I noticed within a few seconds a slight acid taste in the saliva and two or three seconds later a sensation of flushing over the whole body with momentary slight tingling in the extremities. These symptoms, I think, are due to an alteration in the chemical reaction of the blood before the acid is neutralized. So far I believe I am justified in claiming that intravenous injection of calcium acetyl salicylate produces a greater and more immediate relief of pain than aspirin given by the mouth, and its administration is not harmful. It will act beneficially in many cases where other remedies have failed, and it can be repeated daily.

REFERENCES.
¹ Stockman, BRITISH MEDICAL JOURNAL, 1913, i, p. 593. ² Cushny, *Pharmacology and Therapeutics*, 1918.

EXTROVERSION OF THE BLADDER: THE SEQUEL TO TWO CASES.

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In the BRITISH MEDICAL JOURNAL for April 28th, 1906,¹ were published some cases of extroversion of the bladder, in which a method of extraperitoneal implantation of the ureters into the rectum had been adopted. The first operation was performed on May 12th, 1899, and the method employed was original so far as we were concerned, and indeed has since been termed by Dr. Jaromir Jelinek of Brunn (Moravia) in his exhaustive pamphlet² the "Lendon-Peters operation," the late Dr. Peters³ of Toronto having operated in a precisely similar manner in July, 1899. Dr. J. J. Buchanan⁴ of Pittsburg, however, points out that both Dr. Peters and ourselves were anticipated by Bergenhem (Sweden) in 1896, by Pozza (Italy) in 1897, and by Martin (U.S.A.) and Capello (Italy) in 1898. The operation should, therefore, properly be known as "Bergenhem's." As the two patients, whose cases were described at length, have recently died, it was thought that a brief account of their condition during the many years they survived, and of the *post-mortem* findings in one case, might be of interest.

CASE I (DR. LENDON'S).

In the case of this patient the operation was performed on May 12th, 1899, and he died on Christmas Eve, 1920, having thus survived over twenty-one years. The operation was performed when he was only 9 years of age, and as previous operations for the radical cure of large inguinal herniae had involved castration, he showed some of the characteristic features of a eunuch—namely, piping alto voice, hairless face, and childish countenance. He was broad and stout, his maximum weight was 8 st. 3 lb., and height 5 ft. 5½ in. when aged 23; other members of his family were much taller. He became a barber, a calling for which by temperament he seemed well fitted, and he continued to shave and amuse his customers till he was about 28 years of age.

He remained in perfectly good health for quite nine years after the operation (1899–1908), and he could always hold his water in the rectum all through the night. During the next ten years he had occasional bouts of illness, which included rigors, vomiting, pains in the loins and groins, and occasionally diarrhoea. The attacks were naturally attributed to uretero-pyelo-nephritis, and in confirmation of this idea there was at times some tenderness on palpating the right kidney.

About Christmas, 1918, his legs began to swell. The following January he contracted influenza. From that time forth he began to go downhill. In March, 1919, he got relief from multiple incisions into the dropsical limbs, and this treatment was repeated on three occasions. There was never any fluid found in the belly, but the right forearm towards the end was swollen, and when ill he was troubled with vomiting, but there were no other corroborative indications of uraemia.

He encountered a severe heat wave in December, 1920, and died on Christmas Eve. A very complete autopsy was performed by Dr. C. T. Turner, the urinary apparatus, together with the lower bowel, being removed *en bloc*, and the whole pelvis extracted.

Post-mortem Notes.

The only traces of the genital organs remaining were remnants of the crura of the penis. The bladder was replaced by scar tissue, behind which was some perivesical fat, and the fibrous structures which constituted a strong ligament between the separated halves of the pubes. (This has been well described by Professor Watson in one of our cases previously reported.⁵) The left kidney with its ureter was embedded all the way down in a dense mass of hard fat; it was a little difficult to find the kidney, and very difficult to trace the ureter. The kidney itself was much shrunken, tough, with wasted cortex (1 mm.), and dilated calyces filled with greenish-grey putty-like material. The ureter was 21 cm. in length and of varying calibre—the upper fifth the size of a slate pencil, the middle portion that of a lead pencil, whilst the lower end was strictured and kinked, becoming dilated again at its entry into the rectum on the left antero-lateral aspect, 5½ cm. above the anal margin. Its site was easily found in the rectum by a small polypoid projection.

The right kidney was a complete contrast. Its capsule peeled fairly readily, and its cortex measured 4 mm. There was some dilatation of the calyces, which were filled with semi-purulent material having the characteristic odour of the *Bacillus coli communis*. The right ureter was slightly dilated all the way down, and measured 6 mm. in diameter where it opened into the rectum, 8 cm. above the anus, where its gaping orifice admitted a No. 9 catheter.

Notes on the Pelvis, by PROFESSOR WOOD-JONES.

The pelvis (No. 1) is rearticulated after maceration. The sacro-sciatic notch may be described as ultra-masculine in type. The first three sacral elements remain ununited, and all epiphyseal lines are distinct. The epiphyses for the iliac crests and for the tuberosities of the ischia are separate. The backward rotation of the ilia is not nearly so well marked as in pelvis No. 2 (that of a girl aged 8), but the ilia are still more markedly upright. The sacrum is flattened from side to side and from above downward, but the loss of curvature is not nearly so marked as in pelvis No. 2. Three sacral elements articulate with the ilia, but the first element has been almost completely liberated from the articulation; the first coccygeal element has undergone sacralization. As in pelvis No. 2 there are joints between the laminae of the first two sacral vertebrae; the posterior arches of these two vertebrae are incomplete. The upper articular facets of the first sacral element are of the normal sacral type. The ischio-pubic ramus is slender, and the