over an inclined plane enabled the three fragments to come well together, but their mutual relations were considerably disturbed by comparatively slight movement of the body. The tendo Achillis was then divided, and the long splint applied, with an extra dress weight of thirty pounds. The parts fell into excellent position, and could be firmly and evenly maintained there. The wound was dressed antiseptically. The patient was greatly shaken by the accident, and had received, in addition to the above injury, a very severe laceration of the arm, and a compound fracture of the left leg into the ankle-joint. He never rallied from the shock, but, in a few days, became delirious, and died eight days after his admission. At the *post mortem* examination the observations above made were verified at leisure.

CASE III.—R. B., basket-maker, aged 51, admitted January 4th, 1881. While under the influence of drink, the patient had slipped over a stone, and had fallen upon his hands and knees, striking the left knee against the kerbstone. There was a very oblique fracture of the lower third of the shaft, with a second fracture into the knee-joint that separated the two condyles. Both the lower fragments were found, on admission, to be drawn forcibly into the ham; and this deformity was exaggerated greatly by extension. The displacement had probably been effected by the patient's drunken attempt to rise. The limb was adjusted as above described. Shortly after admission, the patient had an attack of delirium tremens. During the attack, the value of the large splint, in allowing of the body being kept fixed, was well demonstrated. Had any suspension splint been applied, it would have probably proved useless, as the patient was extremely restless. The section of the tendo Achillis at least prevented the gastrocnemius from taking any part in promoting displacement. The patient never recovered from the delirium, but gradually sank into a state of dementia, lost all control over his sphincters, became comatose, and died exactly thirty days after his admission. The *post mortem* examination revealed a somewhat remarkable fracture. It was oblique from behind downwards and forwards, and, commencing six inches above the condyles, ran down to the trochlear surface in front. In some part of the course, it was nearly vertical. The two corner fragments were made up of the two condyles, with a sharp spicule of the shaft attached to each. The fragment of the shaft remaining with the inner condyle was six inches in length; that remaining with the outer condyle, four inches. There were but slight inflammatory changes in the synovial membrane. The fragments were already united by a good deal of sound callus, especially at their upper parts, and were in very good position. The specimen is now in the Museum of the Royal College of Surgeons.

FERROCYANIC TEST PELLETS AS A CLINICAL TEST FOR ALBUMEN.*

By F. W. PAVY, M.D., F.R.S.,

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MOST who have stopped to give consideration to the matter, have, I think, felt that it would be exceedingly desirable if something more convenient than the method of procedure with heat and nitric acid which has been in use so long, were placed at our command as a reliable test for albumen. At least, such is the expression which has from time to time fallen from those I have met; and I have been so strongly impressed myself in this way, as to have been induced to turn my attention towards endeavouring to meet the want. The convenience of the cupric test pellet for sugar inclined me to look for something that could be kept and employed in a solid form; and I started with the view that, to be suitable for the purpose, it must be freely and quickly soluble, devoid of objectionable physical properties, and a sharply marked and reliable precipitant of albumen.

During the last two or three years, I have carried metaphosphoric acid in my urinary pocket-case, and have frequently been in the habit of otherwise employing it. It is known to constitute an excellent test for albumen, and I tried for some time to bring it into a convenient form for use. In a pure state, it is a glacial body, which, although deliquescent, does not quickly dissolve. Kept in fragments, these stick together in such a manner as to prove troublesome at the time of use. I mixed the acid with other agents, as citric acid, sulphate of soda, chloride of sodium, and cane sugar, but I failed to obtain a satisfactory product. Thus, finding that I could not succeed in getting what was wanted with metaphosphoric acid, I looked around for another suitable agent.

Yellow prussiate of potash and acetic acid, employed together, have long been known to furnish a valuable test for albumen. There may be other tests as good, but I think it may be said that there are none that can be spoken of as actually better. Citric acid may be made to take the place of acetic acid, and thus a test capable of being kept and used in a solid form is supplied. The precipitant of the albumen is ferrocyanic acid, and this is liberated just as effectually by citric as by acetic acid.

I, at first, thought that it would suffice simply to mix the yellow prussiate of potash, and citric acid, in the proper proportions, and compress into a pellet to obtain the test in the form I wanted. Experience, however, soon showed me that the matter was not so easily to be disposed of. Difficulties presented themselves which have taken time and consideration to overcome. With the willing and able assistance, however, which Mr. Cooper has rendered in carrying out the mechanical operations I have suggested, a pellet has been produced which seems, as far as I can at present judge, to supply all that can be desired. Its components are the sodic ferrocyanide, and citric acid. Grounds exist for the employment of the sodic instead of the potassic ferrocyanide.

All that is necessary in using the pellet is to crush it to a powdered state, within a folded piece of paper, with a silver or other coin from the pocket, or in any other way that may suggest itself, and to run the powder into an ordinary sized test-tube, and pour in the urine to be examined to the height of about an inch. On simply agitating freely, without the application of heat, a precipitate will immediately, or almost immediately, appear when albumen is present. The test is so delicate, that the smallest amount of albumen gives rise to a distinctly recognisable opalescence, and, with a larger quantity, a dense white precipitate is produced. Instead of crushing the pellet, it may be broken in half, or placed in a whole state in the urine. Used in this way, it takes a minute or so for it to be dissolved, and the reaction to be produced.

An estimate may be formed of the amount of albumen present by allowing the precipitate to settle, and reading off its height in proportion to the contents of the tube, in the same way as is done after the application of heat. As no employment of heat is required in the application of the test, it is not necessary that a test-tube should be used. A wine-glass or medicine-bottle will answer instead, and the quantity of urine should be kept down to about that recommended when a test-tube is used. Enough acid exists in the pellet not only for liberating the ferrocyanic acid from the ferrocyanide, but for more than neutralising the alkalinity that is likely to belong to a specimen of urine limited to the quantity which has been recommended to be taken. Through this circumstance, the test acts equally well with alkaline as with acid specimens of urine.

Phosphates do not interfere with the validity of the reaction given by the test. They not only are not liable to be precipitated by it, but the acid present will promote the solution of phosphates already deposited.

Should the urine be turbid from lithates, it must be cleared by warming before the test is employed. A number of ways in which this can be done will readily suggest themselves, without recourse to the use of a spirit-lamp where no spirit-lamp happens to be at hand. If thought proper, the test may be used in the same manner as some persons are in the habit of employing strong nitric acid: viz., by bringing the specimen and the test into contact with each other without admixture, and looking at the line of junction for the precipitate. Thus used, the pellet should be dissolved in a little more than sufficient water to cover it, and the urine then allowed to flow gently down the side of the test-tube until a stratum of about half an inch in height has collected. The lamina of precipitate which is formed from specimens containing a minute amount of albumen comes out denser and more sharply defined than with nitric acid. Further, if the contents of the tube be afterwards shaken together, a diffused precipitate is visible; whilst in the case of the strong nitric acid the precipitate disappears.

With urine containing oleo-resinous matter consequent upon the administration of an oleo-resin medicinally, it is known that nitric and other acids occasion a precipitate. The same will naturally occur with the ferrocyanic pellets, and this is the only fallacious indication that I am at present aware belongs to the test. Error from this cause, whenever the conditions permit it to be presented, must be guarded against in the same way as has been hitherto done under the employment of nitric acid.

Since this communication was written I have seen the albumen precipitant test papers introduced by Dr. Oliver, of Harrogate. They certainly form a very neat and elegant adaptation. Whilst encountering the difficulties that presented themselves with the pro-

* Communicated to the Clinical Society, February 9th, 1883.

duction in a satisfactory state of the ferrocyanic pellets, the idea crossed my mind of papers soaked separately in the two agents and dried, but I did not act upon it, as I thought the presence of the paper in the test tube would be undesirable, and that it would be best, if possible, to keep from any extraneous substance. In the pellets there is nothing besides the two agents actually constituting the test, and their nature is such as to be perfectly harmless in every way. Properly preserved in a bottle I have no reason, from the opportunity I have yet had of judging, to think otherwise than that they will keep for an indefinite time. They are made by Mr. Cooper, of 58, Oxford Street.

CASE OF LABOUR COMPLICATED BY CICATRICIAL OCCLUSION OF VAGINA.

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MRS. M., aged 42, a thin spare woman, came to consult me on account of the gradually increasing size of her abdomen, fearing that she might have a tumour, and thinking that, for certain reasons, anything else was out of the question. The menses had appeared for the first time at the age of eighteen, and had then been absent for a year; they had never been regular. The patient had given birth to three children, the youngest of whom was thirteen and a half years old. Considerable difficulty had attended the last confinement, which was conducted by a midwife. According to the patient's account, the child was a very large one, and the midwife failed to extract the shoulders for two hours after the head had been born. *Post partum* hæmorrhage had been severe, and coloured discharge persisted for five weeks.

Since that time, her general health had been very good, but the catamenia only made their appearance two or three times in the course of the year, although the menstrual molimina were more frequent. When the catamenia were present, the discharge was very dark in colour, profuse, and continued for about ten days. The last period had occurred five months previous to my seeing her.

On examination, pregnancy between the fourth and fifth month was diagnosed without difficulty; the foetal heart-sounds were plainly audible. On bimanual examination, the vagina was found to be completely occluded; the finger passed into a *cul-de-sac* about an inch and a half in depth, and not the smallest orifice could be detected either by the finger or with the aid of the speculum. The roof of the vagina was perfectly soft; there was no bulging or tumour, and I decided to let matters rest.

Labour took place at the full term; and I was somewhat relieved to find, on examination, that the stricture had yielded somewhat during the process, and would just admit the tip of the finger; and further, that it was a foot presentation. Three or four small incisions in the sharp margin of the stricture materially assisted the dilatation, and the presence of the hand in the vagina set up strong uterine action. The child was then delivered without difficulty, the patient declining any anæsthetic.

Some slight *post partum* hæmorrhage followed. This was found to proceed from a small vessel in the torn cicatricial tissue, and was easily checked by the application of a little tinct. ferri perchlor. on a small pledget of cotton-wool. A large fibroid tumour was then discovered to occupy the posterior wall of the uterus.

Convalescence was uninterrupted. The vagina was syringed out daily three or four times with solution of permanganate of potash. No rise of temperature occurred. There was no fullness of the breasts, nor formation of milk.

Three months subsequently, the patient came to see me. I found, on examination, that the fibroid had entirely disappeared, and the uterus had returned to its normal size. The annular stricture in the vagina was again closing, and would only just allow the point of the finger to pass. The menses had not returned.

This case is of some interest in showing under what adverse circumstances conception will sometimes take place. I imagine the explanation of the case to be that the menstrual fluid was retained above the stricture until a sufficient amount had been collected to put the parts upon the stretch, and so cause slight dilatation, and then followed the profuse dark discharge which appeared at intervals of five or six months. Conception accidentally occurred immediately after one of these discharges. The menstrual molimina took place with more or less regularity in the intervals between the discharges, and it is somewhat astonishing that no greater inconvenience was occasioned necessitating medical interference.

SURGICAL MEMORANDA.

CASE OF EAR-DISEASE, WITH INTRACRANIAL ABSCESS: TREPHINING.

CHARLES C., aged 10, had been healthy, with the exception that, when two years old, he had scarlet fever; since which time he has been subject to discharge from the right ear. One week before admission, he was taken ill, somewhat suddenly, with headache, earache on the right side, vomiting, and bleeding at the nose. During the week, he was very ill, and had on one occasion a temperature of 105° Fahr.

The patient was admitted on September 8th, 1882. On admission, he was dull, but quite conscious. There was no rash, and no signs of disease in the heart or lungs. The spleen was enlarged. Temperature 104° Fahr. During the day, he complained of pain in the right ear, the membrane of which was destroyed. There was some general tenderness in the neighbourhood of the ear, but not confined to the mastoid region; no swelling or redness. In the evening, he had a rigor. Temperature 103.8°. During the next few days, the rigors continued, with high temperatures: on two occasions rising to 108.8°. The tenderness in the region of the right ear continued; and, on the 16th, there was some general swelling behind the ear, with pain on movement of the head. On the 18th, there was distinct and defined swelling, with redness and tenderness directly behind the right ear. He had now had, in the nine preceding days, ten rigors, three of which were on the 17th, with temperatures of 103.8°, 107°, and 109.2°; and, on the morning of the 18th, he had two more, with temperatures of 106.5° and 107.6° respectively. Consciousness was completely preserved, though he was somewhat restless, yet drowsy. It was decided to trephine at the centre of the swelling, three-quarters of an inch behind the right ear. Here, with the smallest sized crown of the trephine, an opening was made through the skull into the interior of the cranium (not into the mastoid cells, but behind them). About one ounce of thick, very offensive pus escaped; and it was seen that it had been contained in a space between the skull and dura mater, which were here completely separated; the separation was felt with the probe to extend for an inch posteriorly from the trephine opening.

The patient was much quieter after the trephining, and slept a good deal; the rigors ceased. He had had altogether twelve rigors during the ten days he had been in hospital; but they now ceased, and he had no rigor for seven days after the evacuation of the abscess. He became more drowsy during the next few days, and gradually passed into a comatose condition, which continued till his death. On the 20th, it was noticed, on syringing the ear, that some of the fluid injected at the meatus escaped through the trephine wound. On the 19th, there was some swelling of the right eyelid: this rapidly increased, and the next day there was also proptosis of the eye, and so much chemosis that the conjunctiva projected between the lids, and required pricking. The swelling of the lids and proptosis gradually subsided; but, on the 29th, a small abscess appeared on the inner side of the orbit. On the 25th, an abscess had formed in the neck, about two inches below the right ear; this was incised. On the same day, he had a rigor, with a temperature of 109° Fahr. (This was the first rigor since the trephining seven days previously.) On the 26th, 27th, and 28th, he had on each day two rigors, and, the coma gradually increasing, he died on the 30th.

Post Mortem Examination.—On opening the cranium, there was found general, though slight, purulent meningitis, more at the convexity than at the base of brain. The abscess cavity between the skull and dura mater, behind the right ear, was found to contain a few drops of pus. The right lateral sinus was plugged with firm adherent clot, which in places was breaking down into pus. The inflammation in the sinus had extended forwards, along the petrosal and cavernous sinuses, into the ophthalmic vein. In the orbit, several of the veins were found to contain pus, and the orbital fat was infiltrated with pus. There was a small defined abscess between the external rectus and the eyeball, and a second behind the upper eyelid. The jugular vein was natural. In the neck, on the right side, three distinct abscesses were found: one beneath the sterno-mastoid (which was opened on the 25th); this led down to the axis and atlas, on both of which there were small surfaces of bare bone. The petrous bone was not carious. The mastoid cells contained a cheesy, semi-solid material. The lungs contained numerous infarcts, some of which were suppurating. The spleen was much enlarged, but there were no infarcts.

REMARKS. - The abscesses in the right orbit, and in the right side