such physical signs, when in association, are evidence of aneurism, and of no other kind of tumour, let it be glandular, cancerous, hydatid or other, or of psaos or iliac abscess.

Situation of the Aneurism.—In both, it was looked upon as of the abdominal aorta, near its bifurcation. The position and the immobility of the pulsating tumour, together with the neuralgic pains in the spine, pointed to the correctness of the supposition; while the fact that the cure of the aneurism, in Case No. II, was accompanied by the disappearance of the pulse in the femoral arteries, rendered the possibility of the aneurism being situated in the inferior mesenteric artery, or in one of its branches, as highly improbable.

Etiology.—Both patients were under thirty years of age. The history of previous syphilis in the second was clear. The supposition, therefore, that in both the lesion of the arterial coats was inflammatory in nature, and not atheromatous, was rendered very certain. If it be true that, in this lesion, an inflammatory process commences just external to the lining membrane, leading to a deposition of lymph there, producing elevation of the internal surface, and, as a consequence of the pressure and of the interruption of the nutrient supply, atrophy and erosion of the endarterial membrane, it may readily be understood how easily the already thinned arterial wall will dilate, and become in time converted into a lateral sacculated aneurism.

Anatomical or Specific Character of the Aneurism.—In both, it was observed that the aneurism was of the lateral sacculated variety. In the first case, the sac was enlarging to the left; in the second, to the right. Whilst coagulation of the blood within the aneurism is scarcely obtainable in the peripheric dilating aneurism, in the lateral sacculated variety there is a natural tendency to such coagulation, and coagulation does actually promote anatomical cure. Hence, it would seem that the clinical distinction of these two great varieties of aneurism is not mere scholastic refinement, but of practical importance. For this reason, therefore, is the value of estimating the physical condition of the aneurism; for upon such determination is the treatment to be decided upon.

In the treatment, whether constitutional or mechanical, the principle was recognised that it is necessary for the circulation to be enfeebled or impeded, in order that the aneurismal sac may become filled with the constituents of the blood, and in process of time rendered impervious; the term constitutional treatment being regarded to include the dietetic, medicinal, and postural requirements. In the first case, the object was gained by constitutional treatment alone; in the second, by mechanical treatment, after the constitutional treatment had been unprofitable. The effect, then, of the administration of the iodide of potassium, in association with the rest and the regulated diet, in the first case, may be conjectured to have been the gradual filling, with the constituents of the blood, and the subsequent shrinking of the aneurismal sac, but without obliteration of the aorta, on the cardiac side of the aneurism, the circulation in the arteries on the distal side of the aneurism continuing uninterrupted. In the mechanical treatment, that by the application of pressure, more than this is effected; for it may justly be assumed that the current of the blood along the aorta, and thence into the aneurism, is either wholly or in a great measure arrested. This temporary condition of the aorta and of the aneurism being the same, or nearly similar, to that which arises when a ligature is applied to a large artery on the cardiac side of an aneurism, namely, upon the drawing tight of the ligature, there would be a cessation of the pulsation and of the murmur in the aneurismal tumour, which would at the same time subside, becoming partially emptied of blood. Though the direct flow of blood is arrested by the ligature, after a varying interval of time, blood will enter the aneurismal sac by the interostulating circulation; and it is from this blood that the sac becomes filled, it is supposed, by fibrin, deposited in stratified layers, as in spontaneous cure of the disease. So far, therefore, the mechanical treatment of aneurism by arterial compression, and that by the application of a ligature on the cardiac side of the aneurism, may be compared, and may be regarded as analogous; but, when the compression is removed and the blood again circulates, the condition is very different—in that, where the compression has been employed, the blood circulates directly, passing to the aneurismal sac in its usual channel; but where a ligature has been applied, the blood comes indirectly to the aneurismal sac, passing in a circuitous route. The question presents itself: is this difference such as to determine the deposit of the constituents of the blood, either in laminated fibrin or in coagulum? The interval of time that elapsed between the compression and the consolidation would be in favour of laminated fibrin being first deposited, and subsequently that a coagulum was superadded, filling the aneurismal sac and blocking the aorta. This is the explanation that is offered. The difference of time in Case No. II, in Dr. Murray's case, and in others, for the process to be accomplished, possibly was dependent upon constitutional differences,

more especially upon a difference in the quality and plasticity of the blood.

If it be admitted that the supposition is the correct one: that the filling up of the aneurismal sac is by stratified fibrin, and finally by coagulation of blood, it is unnecessary to apply pressure to wholly interrupt the circulation; but rather moderate compression only is necessary to lower the force of the circulation, and the mechanical treatment should be in accordance with the constitutional treatment.

The channel through which the blood was carried, after the cessation of the circulation in the abdominal aorta, in Case No. II, for the present is visionary; but, from the similarity of the position of the aneurism to that in Dr. Murray's case, which was disclosed on necropsy, and which it was deemed expedient to give when the case was referred to, it may be presumed that the circulation was similarly carried on.

The bloody mucus that was passed *per anum* was regarded as the result of the congestion of the intestinal vessels, following upon the pressure—not the consequence of rupture of the vessels produced by the compressing pad; for, if such had been the condition, blood, either liquid or in the condition of coagulum, would have been voided.

The conclusion deducible from this consideration is, that aneurismal tumours of the lower portion of the abdominal aorta may be successfully treated by arterial compression on the cardiac side of the aneurism; but that this method is a dangerous one, and should not be employed until the constitutional treatment has failed; and that, if arterial compression be employed, it should be moderate and prolonged, rather than complete and of short duration.

A CASE OF CONGENITAL CYANOSIS, IN WHICH A PATENT FORAMEN OVALE WAS ASSO- CIATED WITH A PRESYSTOLIC BASIC MURMUR.

By GEORGE JOHNSON, M.D., F.R.S.,

Professor of Clinical Medicine: Senior Physician to King's College Hospital.

ON June 1st, 1870, I had, through the kindness of my friend Mr. Charles Hood, the opportunity of examining an inmate of the British Home for Incurables, who from his birth had been cyanosed. I copy *verbatim* the notes which I made on the day of the examination.

"Henry Burgess, aged 27, has been blue from birth; has spat blood; legs cedematous and purple; thumbs and fingers clubbed; pulse feeble, rather small. A bellows-sound over base, alternating with the impulse, rather presystolic than diastolic. The probable cause is a current of blood from the stronger left to the weaker right auricle through the open foramen ovale during the auricular systole. The blueness, the hæmoptysis, and the oedema of legs, are consequences of overfulness of veins, the result of arterial blood going from the left to the right side. He often has headache and giddiness. The normal second sound (valvular click) scarcely audible."

I saw the patient only on that one occasion; and I heard no more of him until the 23rd of last November, when I received a note from Dr. Fairfield, the Medical Officer of the British Home for Incurables, informing me of the man's death, and inviting me to attend the inspection of the body on the following day. Unfortunately, I was unable to attend; but Dr. Fairfield did me the favour to send me the following "Notes of the *post mortem* appearances. Henry Burgess, aged 35. Cyanosis. November 24th, 1877. Lungs healthy. Liver and spleen much enlarged. Heart of an extraordinary size, with open foramen ovale about as large as a five-shilling piece. The hypertrophy general, but especially the right ventricle. The walls of great firmness when cut through, measuring an inch in thickness. Chambers much enlarged. Weight of the heart estimated at twenty ounces. Pulmonary artery natural size; valves properly formed; ventricular septum complete; mitral and aortic openings natural; valves healthy; large vessels in connection with the heart regularly distributed."

I regret that I have not a more complete history of this interesting case of uncomplicated patulous foramen ovale; but there is, I think, conclusive evidence that the presystolic basic murmur was the result of a current of blood through the foramen ovale during the auricular systole; and that the current was from the left to the right auricle is rendered nearly certain by the evidence of systemic venous fullness, with comparative arterial emptiness. The general lividity, the enlargement of the liver and spleen, and the oedema of the legs, are all results and evidence of systemic venous engorgement. The hæmoptysis, too, was probably a result of bronchial venous and capillary congestion; the bronchial veins forming part of the systemic venous system, and opening through the vena azygos and the left superior

intercostal vein into the superior cava. Again, the great hypertrophy of the right ventricle is to be explained partly by the extra effort required to propel the excess of blood on the venous side of the heart; partly, perhaps, by the impeded passage of a mixture of arterial with venous blood through the pulmonary arterioles: an impediment analogous to that which a mixture of venous with arterial blood encounters in the systemic arterioles. On the other hand, the deficiency of blood and of pressure in the systemic arteries is indicated by the radial pulse being "feeble and rather small", and by the "normal second sound (valvular click) being scarcely audible". There is, I admit, a deficiency in this part of my clinical record. I ought to have noted the second sound over the pulmonary and the aortic valves respectively. It seems probable that, while the aortic second sound was enfeebled by the want of tension in that vessel, the pulmonary second sound to the left of the sternum may have been intensified by the increased tension resulting from the hypertrophied right ventricle and the before suggested resistance in the pulmonary arterioles.

This case throws no light upon the disputed question of the relative share which venous turgescence and the admixture of venous with arterial blood respectively have in causing cyanosis. As I have already pointed out, there was abundant evidence of systemic venous engorgement; but there was probably also some mixture of venous with arterial blood in the left auricle and ventricle, and therefore in the systemic arteries. It seems likely that this would occur in the following mode. During the systole of the auricles, the right auricle, in consequence of the influx of blood from the left through the foramen ovale, would empty itself less completely than the left; then, during the succeeding auricular diastole, some blood would flow from the partially filled right auricle into the left. There would be a to-and-fro tidal flow of blood through the open foramen ovale, an active propulsion of arterial blood to the right during the auricular systole, and a passive flow of venous blood to the left during the auricular diastole. The general result would be an excess of blood in the right cavities of the heart and in the whole systemic venous system, with some mixture of arterial and venous blood in the left cavities and in the systemic arteries.

In a paper on Cyanosis (*Medical Times and Gazette*, September 1859), Dr. Tilbury Fox argued from *à priori* considerations that, if a patulous foramen ovale gives rise to a murmur, the murmur must be presystolic and synchronous with the auricular systole. It is only within the last few days that I found a reference to Dr. Fox's paper, and so had the opportunity of reading it. He will probably be interested to find in the case which I have here briefly recorded a confirmation of his theory published nearly twenty years ago.

Finally, I would remark that this case appears to me to afford confirmatory evidence in support of Dr. Gairdner's auricular systolic theory of the so-called *presystolic mitral murmur*.

CASE OF UTERINE HYDATIDS TREATED BY THE INTRA-UTERINE INJECTION OF HOT WATER.

By LOMBE ATTHILL, M.D.,
Master of the Rotunda Hospital, Dublin.

On the 18th of December last, I was asked to see a lady stated to be threatened with a miscarriage. She was a very delicate woman, a member of a family of whom several had died of consumption, she herself having suffered from ulcer of the stomach. On my visiting her, she stated that she had reached the twelfth week of pregnancy, had that morning been attacked with hæmorrhage, but was quite free from pain. On making a vaginal examination, I found the uterus to be of the size corresponding to the three months of pregnancy, and the os very slightly dilated. I ordered an ounce of the infusion of ergot to be given every third hour, and enjoined absolute rest. Everything went on satisfactorily for some days; the hæmorrhage ceased; she suffered no pain, and felt so well that I had much difficulty in inducing her to observe the recumbent posture. On the 20th, she began to go about; and on the 21st, having stood about a good deal, hæmorrhage again set in, this time profusely. On seeing her after the lapse of some hours, I found her very weak. She had lost a great deal of blood, and it continued to flow. The os was about the size of a threepenny-piece. There were not any pains, and nothing could be felt inside the os. I decided on plugging the vagina, and recommended the exhibition of ergot.

The next morning, I removed the plug, and was disappointed to find that no portion of the ovum protruded; but the os uteri was more patulous, and something soft could be felt inside it.

As she began to lose blood again, I decided to dilate the os and remove the ovum. With this view, I introduced a large sponge-tent. This I removed in six hours, but was again disappointed at finding that no ovum could be detected; while the hæmorrhage continued, and no uterine action had been excited.

Matters were now becoming serious. The patient had become very weak. Evidently the uterus must be emptied of its contents, whatever it was; and the hæmorrhage checked. After some hesitation, I decided on trying the effect of hot water, and accordingly introduced the tube of a Higginson's syringe into the uterus, and injected about a pint of water at the temperature of 112 deg. This within ten minutes induced uterine action. The pains were very sharp; and in a short time a mass, which on subsequent examination proved to be hydatids, was expelled. No further hæmorrhage occurred for about six hours, when, pains again setting in, slight hæmorrhage, followed by the expulsion of another mass of hydatids, occurred. From this time, no further trouble was experienced. The lady made a rapid recovery.

In this case, I was quite uncertain as to what the contents of the uterus might be. I had not previously heard of hot water being injected in cases of abortion; but my experience of it in *post partum* hæmorrhage was so favourable, that I resolved to try it in this case; the only other alternative being either plugging the vagina again or the continuing of the process of dilating the cervix. Either of these courses seemed to me, under existing circumstances, to be by no means free from risk.

My idea in injecting the hot water was to restrain the hæmorrhage, and I was not prepared for its acting as such a powerful stimulant to the uterus as to induce uterine action within the lapse of a few minutes. I need hardly add that I was much gratified by the result.

Since this case occurred, I have treated three cases of abortion accompanied by hæmorrhage in a similar manner. In two of these, the like results followed; namely, the exciting of uterine action and the arrest of hæmorrhage. In the third case, the hæmorrhage was arrested for twelve hours; but no pains followed. Hæmorrhage then recurring, I again injected hot water, with similar results. The ovum was not expelled till the lapse of twenty-four hours after the second injection.

Judging from these cases, I look on the treatment of hæmorrhage occurring during abortion by the injection of hot water (of a temperature not under 110 deg.) as perfectly safe; and that it is, on the whole, more reliable and satisfactory than any other method.

CLINICAL MEMORANDA.

CATGUT DRAINAGE.

In reply to Mr. Chiene, I beg to state that my assertion that catgut drainage is most inefficient is based upon the following facts. 1. After the gut has become saturated by the contiguous fluids, it ceases almost entirely to drain at all. In proof of this, the following experiment may be performed. Place one end of a skein of catgut in a glass vessel containing water, and let the other end hang over the side of a second empty vessel: it will be found that very shortly the water begins to come over by capillary attraction, but, as soon as the point of saturation is reached, the flow becomes quite arrested, owing to the increase of friction which capillarity fails to overcome. 2. Catgut drainage is inefficient, because it does not remove the fluids from the deepest part of a wound, but only acts upon the fluids near the surface. This statement is true in all the cases in which I have seen catgut employed for the purposes of drainage, where a skein is used which traverses the wound from side to side but does not touch at any point the deepest parts of the incision: this, perhaps, might, to some small extent, be obviated by pushing one end to the bottom of the wound, and allowing the other end alone to hang dependent from the line of incision; but, if so placed, the deeper portion would in a short time become quite sodden, and no longer convey any of the fluids to the other from the end of the skein, even if it were possible, which I question, to maintain the gut in this position. 3. Catgut is inefficient, because it softens and breaks down before the wound has ceased to discharge. After a few days, the skein of catgut divides into two and comes away on traction at each end, and this very generally before drainage can be dispensed with. It may be affirmed that this constitutes no real objection, as it is an easy matter to introduce a fresh skein; but, in reply to this argument, I should say that such fresh introduction cannot take place without, in many cases, an undesirable opening up and separation of newly adhering tissues.

S. MESSENGER BRADLEY, Manchester.