sition on the undeveloped condition of the genital organs, the bladder being small, the urethra narrow, and the mucous membrane sensitive and liable to laceration. On the other hand, lithotomy in the child had always been a comparatively successful operation; and, so far as my own practice goes, I had no cause in this respect to abandon this operation in favour of litholapaxy, having had the good fortune to have now performed 197 lithotomies in male children with only 1 death. In fact, it was only after having had a run of 191 successful lithotomies in children that a fatal case occurred. In spite of this, however, I was so much impressed by the results announced by Keegan in two very able papers published in the *Indian Medical Gazette* in 1885, that I at once ordered the necessary instruments, and decided on giving the operation a trial. Since that time I have performed litholapaxy in male children 158 times, with 2 deaths. My first 119 cases were all successful, and I had then the misfortune of losing 2 cases consecutively. All our foregone theoretical objections to this operation in case of male children have vanished into thin air when pitted against the stern reality of accomplished facts. Notwithstanding the great success I have had with lithotomy, I have now practically abandoned the operation in favour of litholapaxy, owing to the two great advantages that the latter possesses—rapidity of cure and avoidance of a cutting operation. To Keegan is due the honour of having, in the face of strong opposition, shown that litholapaxy in male children is a feasible and safe operation.

MORTALITY.

Amongst these 598 litholapaxy cases there were 11 deaths; namely, 9 amongst 426 operations on adults, and 2 amongst 164 on children. These fatal cases, with the exception of the last two, have been fully reported in the medical journals from time to time; and the details of the remaining two will be given in due course, when I publish my next series of stone operations. The causes of death were: exhaustion 5 (with pneumonia superadded in 1); peritonitis, 2; pyæmia, 1; acute nephritis, 1; and acute cystitis, 2. All these were in bad health when coming under operation except one; and this patient had had retention of urine for thirty-six hours, with the calculus blocking the prostatic urethra. The kidneys were diseased in several of the cases, particularly in one, from whom I removed $3\frac{1}{2}$ ounces of oxalate of lime stone, and in the case which died from acute nephritis. In this latter I found at the necropsy two calculi in the right kidney, weighing 2 drachms. One patient was 90 years of age. One, a child of 13 years, who died of cystitis, had been roughly sounded a week before coming under my care, since which time he had been in great agony, so that probably the bladder had been injured during the sounding.

The 11 deaths in 598 litholapaxy operations, namely, 434 adults with 9 deaths, and 164 children with 2 deaths, give a mortality of 1.84 per cent. on the whole, or about 2 per cent. in adults and 1.22 per cent. in children. There were, on the other hand, 254 lithotomies in my practice with 11 deaths, namely, 54 adults with 10 deaths and 200 children with 1 death, giving a mortality of $4\frac{1}{2}$ per cent. on the whole, or $18\frac{1}{2}$ per cent. in the adult, with $\frac{1}{2}$ per cent. in children.

This is, however, not a fair method of comparing the results of the two operations, as since the introduction of litholapaxy into my practice only those patients that were unsuitable for this operation were subjected to lithotomy. Previous to my commencing to operate by litholapaxy I had done 94 lithotomies, of which 33 were in the adult with 6 deaths, or a mortality of 18 per cent., there being no deaths amongst children. Since then I have performed 758 operations in all with 16 deaths, or about 2 per cent., namely, 455 in the adult (434 litholapaxies with 9 deaths, and 21 lithotomies with 4 deaths) with 13 deaths, or less than 3 per cent.; and 303 in children (164 litholapaxies with 2 deaths, and 139 lithotomies with 1 death) with 3 deaths, or about 1 per cent. This is the proper method of comparing the results of the two operations; and, setting aside the results in children in whom lithotomy has always been a comparatively successful operation, it will be observed that the introduction of litholapaxy into my practice has had the effect of reducing the mortality in operations for stone in the adult from 18 to 3 per cent.

I may here point out that though I have been singularly fortunate in my lithotomy cases in children, the mortality attending this operation in the adult in my hands approximates pretty closely to that recorded in hospital practice both in England and India. Thus, Sir Henry Thompson has collected details of 1,827 lithotomies performed in British hospitals previous to the introduction of litholapaxy, showing 229 deaths, or $12\frac{1}{2}$ per cent. There were 1,028 children with 68 deaths, or $6\frac{1}{2}$ per cent., and 799 adults with 161 deaths, or 20 per cent. In an article in the *Lancet*, March, 1885, I gave the statistics of 2,592 lithotomy operations performed in Indian hospitals in 1882, showing a mortality of about 13 per cent. on the whole, practically the same as in British hospitals.

When I commenced to perform litholapaxy in 1882, I at first adopted this operation in selected cases in the adult only, relegating the difficult cases to lithotomy; then, as I gained experience, extending it to most of my adult cases. Then, in 1886, influenced by Keegan's results, I extended the operation to male children. I have now practically abandoned lithotomy in my practice in favour of litholapaxy, the force of which remark will be seen when I state that amongst the last 300 cases of stone performed by me in patients of all ages from 2 to 90 years, the calculi weighing from 2 grains to $6\frac{1}{2}$ ounces, there were only 6 lithotomies (1 suprapubic and 5 perineal), the modern operation having been found feasible in all the other 294 cases. In 1890 I had 106 cases of stone under my care, and they were one and all treated by litholapaxy with one death. With results such as these I have not felt inclined to follow the lead of Sir Henry Thompson in his attempt to revive the operation of suprapubic lithotomy in cases of large calculi when I could deal with them by litholapaxy, nor of his somewhat rash imitators who adopt the suprapubic operation in cases of small stone. I do not think that we can expect to improve on the results above indicated whilst we continue to extend the operation of litholapaxy to all patients coming under our care, no matter in what condition, even to apparently hopeless cases. They are, indeed, results unequalled, I venture to say, in any other large and important operation in surgery, and entirely due to the introduction of Bigelow's method of operating. That great surgeon is now no more, but his name is imperishably connected with the modern operation for stone and the word "litholapaxy" which he introduced to denote it.

THE POSITION OF A HUMAN BODY BURNT, BUT NOT COMPLETELY DESTROYED, BY FIRE.

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PHYSIOLOGICALLY, we know that a muscle contracts by heat, and that if the action of heat be continued, it passes into a state of heat stiffening or heat rigor, a condition beyond recall by the use of any known process. Anatomically, it is interesting to note that the larger a muscle in any one group, the nearer its relation to the surface.

The muscles of the human body are not conductors of heat; it follows, therefore, that heat would take a longer time to affect the deeper muscles than it would the more superficial ones, as heat must reach the deeper ones in the first place by convection and radiation through the already stiffened superficial muscles. It follows, therefore, that an intact human body which is subjected to heat in a sufficient degree, and which has not been affected with *rigor mortis*, will assume a position which is determined by the contraction of all the superficial muscles. This position, being the resultant of all the superficial muscular forces, might be called the position of superficial muscular equilibrium. If heat stiffening has taken place, this position is permanent until putrefaction is complete, unless destroyed by mechanical means.

The position of such a body clearly has no relation to the position it occupied before being affected by heat. The head must be kept in the middle line of the body, the jaws

firmly closed, the chin extended, the head extended back upon the neck, the neck straight, the upper part of the chest in a position of inspiration, the shoulders slightly raised, the arms raised outwards almost to a right angle, more backward than forward, the elbow flexed, the forearm in a position of supination, the spine straight and extended, the pelvis very slightly tilted upwards, the thigh extended, abducted and rotated outwards, and the knee flexed.

In a body in which *rigor mortis* is fully established in its second stage, or has passed off, the muscles are dead and will not react to heat; so such a body would occupy the same position as it did when heat reached it. Would it not be possible, then, to say, from the position of such a body, whether *rigor mortis* had occurred or not, so as to reach some data as to the time such a body had been dead? The factors of *rigor mortis* being destroyed by heat, *rigor mortis* would not occur in contracted and heat-stiffened muscles, as it would not have had time to declare itself.

The accompanying drawing—made from a rough sketch I took of the remains of the late Mr. Welch, the victim of the recent case at Colchester—is a fair representation. It is seen that the head inclines to the left shoulder; there was no skin on the right side of the anterior part of the neck; what was part of the sterno-mastoid was retracted high up in the neck;

below there was no trace of that muscle because the superior and anterior surfaces of the clavicle at its sternal end had been charred off; the carotid sheath was exposed, and on the antero-external side of the right internal jugular vein were found two small transverse apertures, whose edges were adjacent and regular; on the left side, in front of the neck, the skin, although discoloured and burnt, was intact.

I am of opinion that the sterno-mastoid muscle was cut through, the position of the head to my mind showing that the action of the right sterno-mastoid was wanting.

Some rough experiments I made on the bodies of fresh and kept animals led me to believe that it is possible in a fresh cadaver to modify the position of equilibrium by dividing one or more of the superficial muscles.

In passing I may state that the identity was mainly confirmed by the spinal curvature, which was clearly shown in the remains; and this is worthy of note because I think it shows that if any defect existed before death it would be made apparent after.

Would it be unreasonable to formulate the following?—

1. For bodies burnt before *rigor mortis*: (A) The position of superficial muscular equilibrium described. (B) If a superficial muscle has been divided before the fire reached it position (A) would be altered to an equivalent extent.

2. For bodies burnt after *rigor mortis*: (A) No definite position. (B) If a muscle be divided there is no equivalent alteration of position.

REMOVAL OF UTERUS, OVARIES, AND FALLOPIAN TUBES: RECOVERY.

By EDWARD MALINS, M.D.,

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At a meeting of the Obstetrical Society, held on December 5th, 1892, I showed a specimen of left hæmatosalpinx, weighing 4½ ozs., removed from a girl, aged 19, on May 5th. Through the kind interest of Mr. J. H. Targett, the specimen was reported upon, and placed in the museum of the Royal College of Surgeons. It is represented in Fig. 1.

Fig. 1.—Left Fallopian tube and ovary, Royal College of Surgeons Museum.

The after-history of the case is interesting. In the complete form it may be described as a case of vaginal atresia, left hæmatosalpinx, removal, subsequent hæmatometra; and right hæmatosalpinx, removal. After the first operation the patient apparently did well for a time. She was readmitted into the General Hospital on January 11th, 1893. She stated that up to three months previously her health had been very good. There had been no sign of any menstruation. About this time she noticed a lump on the right side of the abdomen; this became painful and tender to the touch. The uterus could be felt above the pubes, and to the right of it a mobile, elongated tumour, some 3½ inches in length, occupying the iliac fossa. The vagina was occluded at its upper end, and no cervix could be felt through it. It was evident that the two swellings were the uterus and the right Fallopian tube filled with blood.

On January 16th the abdomen was again opened. There were some adhesions to the anterior wall, omentum, and between the two masses, which embraced the uterus, Fallopian tube, and ovary; these were separated, and the whole manipulated free. The tube was transfixed, and tied up with the accompanying ovary; the uterus was drawn up to the opening, transfixed with a knitting needle about the level of the cervix, a *serre-nœud* placed above it, and the distal part cut off. The peritoneal edges of the wound were carefully sewn round the pedicle, the stump smeared with perchloride of iron, and double cyanide gauze dressings applied. The