years ago, and has been built up within the lives of many of us. It has opened out a wide prospect and gives promise of revolutionizing medical study.

The impulse that the work of Harvey gave to British physiology is shown by naming those who followed him in the next one hundred years.

Thomas Wharton (1614-73), physician to St. Thomas's Hospital, studied at Cambridge and Oxford, discoverer of the sub-maxillary gland, and author of *Adenographia* (1656).

George Joyliffe (1627-58), M.D.Cantab., F.R.C.P., discoverer of the lymph ducts.

Francis Glisson (1597-1677), M.D.Cantab., Fellow and President of this College, author of famous monographs on rickets and the anatomy of the liver.

Thomas Willis (1621-95), M.D.Oxon., F.R.S., F.R.C.P., recognized saccharine diabetes and described the anatomy of the brain (the circle of Willis).

Richard Lower (1631-91), M.D.Oxon., F.R.S., F.R.C.P., performed transfusion.

Edward Tyson (1650-1708) and Samuel Collins (1618-1710) were comparative anatomists.

Clopton Havers described the Haversian canals.

William Cowper or Cooper (1666-1755) described "Cowper's" glands.

ADVANCE OF MEDICINE IN SECOND HALF OF NINETEENTH CENTURY.

But it cannot be claimed that at Cambridge or elsewhere there was any real progress in medical education. Here and there men of genius made discoveries, but they were not aided by any organization either inside or outside the university or medical school. Men like the Hunters did their work at their own expense, and for many years to come even the teaching of anatomy owed most to what was done in private schools.

The best that can be said for British medical education is that it was based upon some genuine knowledge of practical anatomy and bedside acquaintance with diseases. But it was not until the second half of the nineteenth century that a true spirit of reform entered into the schools. In no place was this more manifest than at Cambridge. Although it is still necessary, and probably always will be, for the Cambridge student to seek clinical experience elsewhere, he may find at Cambridge all that he desires in laboratory opportunities, and, within due limitations, for clinical research.

If Cambridge has proved itself worthy of its association with the illustrious Harvey, this is equally true of the great hospital of St. Bartholomew's, with which perhaps his professional connexion is more generally recognized. Harvey left Cambridge apparently as soon as he had completed his arts curriculum, taking no part of his medical education there, and, although he returned there for his degree, he owes to Italy the instruction that opened the way for his great discoveries.

HARVEY AS PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

Of his labours as a physician at St. Bartholomew's we know little, and what records remain do not impress us very favourably with the work done in those days by those who held such appointments as that of Harvey. When he was originally appointed he was only obliged to attend once a week, and he was never formally required to visit the wards. The number of patients seen in the hospital must have been very small, for as late as 1749 the numbers are given as—in-patients, male 16, female 15; out-patients, male 50, female 50, each week; and there is no reason to believe that a hundred years earlier they were more numerous.

Apparently the patients were obliged to come to the doctor and not the doctor to the patients, as one of the rules says:

It is the duty of the matrons and sisters to complain to the doctor if any poor lurk in the house and do not come to him at his sittings or take the medicine he prescribes, but cast it away and abuse it.

It is difficult for us to understand the position of such a man as Harvey holding a post which, to us, seems scarcely likely to afford him any return in the way of useful experience. The salary was inconsiderable, some £20 a year with an allowance for fuel and "livery," but it is possible that the appointment indirectly led to a certain amount of practice, for undoubtedly he made money by his profession, although Willis suggests that his brother Eliab employed the "small capital" accumulated

by him during his active years of practice and before the breaking out of the civil war to such good account that he actually died a rich man. The period during which he may have earned a considerable professional income must have been from about 1607 to 1630.

HARVEY'S LATER YEARS: HIS GIFT TO THE COLLEGE.

After the latter date, when he went abroad with the Duke of Lenox, it is doubtful whether he ever had much opportunity for practice. In 1633 he went with Charles to Scotland, whence he followed him to Oxford (1642), and in 1646, on returning to London, he resigned all his appointments, and as his wife was dead he took up his residence with his brothers Eliab and Daniel. It was then that Harvey felt himself fully justified in making over his paternal estate, then worth £56 per annum, to this College as a free gift during his life and as a provision for the objects of which this annual oration forms part.

He died at the advanced age of 80 on June 3rd, 1657, and I cannot do better than repeat the words of Willis:

So lived, so died one of the great men whom God in virtue of His eternal laws bids to appear on earth from time to time, to enlighten and to ennoble mankind.

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THE CURE OF INGUINAL HERNIA.

BY

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THE high percentage of men who suffer from inguinal hernia has made the problem of their treatment a serious one during the present war. Trusses appear to be most unsatisfactory when used by soldiers. In my personal experience I have rarely seen a truss controlling a hernia. The truss appears to be worn for choice with the hernia unreduced. It may be stated that we regard an inguinal hernia as a congenital deformity due to the presence of an abnormal process of peritoneum. This defect is combined with a lesser acquired defect—namely, an abnormally long process of omentum, or more rarely mesentery. The treatment indicated appears to be abolition of the abnormal process of peritoneum and removal of the redundant omentum. The choice of an operation which will cure the hernia and render a man fit for service in the shortest possible time becomes desirable. Having had charge of a special department for the cure of hernia, dealing with cases at the rate of about 500 a year, the need for a simple operation giving adequate relief and followed by a rapid convalescence has been impressed upon me.

It occurred to me that much of the trouble following the operation for radical cure of hernia, and many of the recurrences, were due to the well-intentioned but ill-advised efforts of the surgeon to effect repair. Bearing in mind that the success of an operation lies in the simplicity thereof, I evolved the procedure described below. The majority of herniæ occurring in men of military age are amenable to cure by a small operation. The operation described below has been performed as a routine method in all cases. The advantages of this operation as a treatment in the hernia of children will be apparent. The principles borne in mind are to remove the sac at the highest possible level with the minimum disturbance of tissue. The cutting and interference with tissues has been reduced to such a degree that very rapid convalescence follows, and the reaction associated with hernia operation is obviated. The advantages of an operation which reduces the cutting of tissues down to an inch incision in the skin and superficial fascia, and a small incision in the spermatic fascia, will be apparent. No dissection of tissues is undertaken; just as Matas in his operation for aneurysm avoided injury and disturbance of surrounding structures by attacking an aneurysm from within the sac, we avoid dissecting, cutting, or injuring the delicate or important structures which surround a hernial sac by attacking the hernia from within the sac.

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

FIG. 1.—An incision about an inch in length has been made, half an inch above Poupart's ligament, over the femoral point. The fibres of the external oblique aponeurosis have been split for a short distance.

FIG. 2.—The edges of the aperture in the external oblique have been retracted by the forceps, A, exposing the coverings of the spermatic cord. The forceps, B, have been placed upon the aperture in the cremaster, which has been made by inserting the closed points of Mayo's scissors and opening the blades. The spermatic fascia is exposed in the depth of the wound.

FIG. 3.—After incising the spermatic fascia the sac has been found and drawn out of the wound. The forceps, A, remain on the external oblique during the whole operation.

FIG. 4.—The sac has been opened and its aperture retracted by forceps, after having been enlarged by snipping the edges between the forceps. Two apertures are displayed divided by a process of peritoneum. The aperture A leads into the abdomen.

FIG. 5.—Forceps have been placed on the crista; a layer of peritoneum has been picked up on its mesial side and this layer is being cut with scissors. By lifting the forceps 1, 2, 3 the clean neck of the sac will be held ready for ligature, isolated from the remainder of the sac B by this incision.

FIG. 6.—The forceps 1, 2, 3 have been raised. The neck of the sac is isolated from the remainder, which has shrunk within the coverings of the cord.

FIG. 7.—Suture of the neck of the sac.

Without entering on the debatable ground of statistics, I am prepared to state definitely that fewer recurrences take place after this operation than after any other method of which I have experience. In hernia, as in other operations, the results depend largely on the selection of cases, and probably any experienced surgeon could operate upon a number of hernia cases by any method with only a small percentage of failures if allowed to choose his cases.

The Operation.

We perform this operation under local anaesthesia as a routine measure. Local anaesthesia possesses great advantages over general anaesthesia for hernia operations. A half per cent. solution of novocain, to which a small quantity of adrenalin is added, is used. The needle of the analgesia syringe is entered at a point midway between the anterior superior iliac spine and the spine of the pubes half an inch above Poupart's ligament. The whole anaesthesia is conducted through this puncture without withdrawing the needle. An incision from half an inch to an inch in length is made over the needle puncture and carried down to the aponeurosis of the external oblique. The fibres of the external oblique are split for a distance of half an inch. The opening in the external oblique should lie directly over the spermatic cord. The cremasteric and spermatic fascial coverings of the cord are drawn through the aperture of the external oblique. The cremasteric fibres are separated and the spermatic fascia incised; the sac is then found lying inside these coverings. Two pairs of fine haemostatic forceps (Halstead's mosquito forceps) are placed upon the edge of the sac, and an incision, half an inch in extent, made between them by a snip of a pair of scissors. The two layers of the sac forming the lips of the aperture are now clipped with haemostatic forceps. The aperture can now be held open by four pairs of forceps, and four incisions are made, one between each pair of forceps, enlarging the aperture sufficiently to display the interior. If omentum lies in the sac it is drawn out, ligatured, and cut off. The interior of the sac presents for examination two apertures, one the internal ring passing into the abdomen, the other passing down the inguinal canal. These apertures are separated from one another by a process of peritoneum, the "crista," and in a well-marked case the apertures resemble the muzzle of a double-barrel shotgun.

The process of peritoneum called the crista corresponds to the internal margin of the internal ring. Forceps are clipped on to the crista in one or two places. It is now necessary to separate the important tube of peritoneum leading into the abdomen (the neck of the sac) from the unimportant tube leading down the inguinal canal. This is done by cutting along the crista to the mesial side of the forceps, and dividing one layer of peritoneum with scissors. As the result of this incision the neck of the sac now lies clear, held by the forceps on the crista on its mesial side, and the forceps on the outer side of the sac. The neck of the sac has in this way been completely exposed and freed without dissection. A gauze swab is gently passed down the outer and inner side of the sac. A gentle pull is made upon the neck of the sac whilst it is ligatured as high up as possible. It will be remembered that the crista corresponds to the internal ring, and by separating the crista forming the neck of the sac in the manner described above, and pulling upon the sac, it has become possible to ligature the peritoneum, forming the neck of the sac, about two inches above the internal ring. It is unnecessary and undesirable to perform any displacing manoeuvre to the neck of the sac. When the sac is cut off distal to the ligature, the elasticity of the peritoneum will displace the ligatured sac well behind the rectus muscle. In 90 per cent. of cases this is all that it is necessary to do, and the skin incision is sutured with silkworm gut passing down to, and taking up the edge of, the external oblique. In cases in which a large internal ring or very thin peritoneum renders a recurrence more possible, the conjoined tendon is drawn over the cord and sutured to Poupart's ligament without enlarging the wound. In exceptional cases it may be considered desirable for similar reasons to convert the operation into a typical Bassini operation. This can be done with ease by enlarging the split in the external oblique for another inch or more, lifting the cord, and suturing the compound tendon of the internal oblique and

transversalis beneath it to Poupart's ligament. Experience has shown that when a recurrence takes place it is usually an immediate recurrence. The recurrence occurring immediately the patient gets up is due to faulty ligature of the neck of the sac. The elastic peritoneum, released after ligature of the aperture, is very liable to slip the ligature. This cannot occur if the aperture formed by the neck of the sac is sewn in addition to simply tying the ligature.

The majority of herniae occurring in men of military age are small bubonocoeles or congenital herniae containing omentum.

I attach considerable importance to the removal of the prolapsed omentum, which is always of abnormal length, with a view to preventing recurrence.

Several sequelae follow hernia operations which are of more significance than recurrence. I refer to such conditions as hydrocele, retraction of testicle, thickening of the spermatic cord, painful scars, neuralgia, and enlargement of the testicle. These unpleasant and almost incurable results are due to damage to the spermatic cord, the delicate structures of which are adversely affected by much less disturbance than is usually supposed. In the operation described the only content of the cord which is either seen or touched is the sac.

I have found this operation of particular value when dealing with cases of recurrent hernia. The new operation is performed above the matted scar tissue of the old operation and completed by Bassini's method almost with as much ease as a primary operation.

MODERN ARTIFICIAL LIMBS AND THEIR INFLUENCE UPON METHODS OF AMPUTATION.*

GENERAL CONSIDERATIONS.

BY

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It may seem at first sight that the title of this paper implies a putting of the cart before the horse; that the artificial limb should be influenced by the amputation which calls it into being, and that the converse should not occur. But unfortunately we have to cut our coat according to our cloth, and the cloth in this case is limited by the mechanical possibilities at our disposal.

Artificial limbs have been used for many centuries, for a Roman artificial leg has been unearthed at Pompeii. The artificial hand of Götz von Berlichingen, made in 1509, is still in existence and in working order and has lately been described in detail in the *Zeitschrift des Vereines Deutscher Ingenieure*, December, 1916. With this hand it is said that Götz was able to strike a harder sword stroke than with his former natural hand. (*Credat Judaeus.*)

In order to produce good results the surgeon and the limb-maker must have some knowledge of each other's limitations.

On the one hand, it is undesirable for the surgeon to design and carry out an amputation, however successful surgically, if the resulting stump is one to which an artificial limb cannot conveniently be attached. On the other hand, it would be useless for a limb-maker to devise a limb, however perfect in theory, if it could not be borne by the patient's stump.

In this country of late years the questions connected with amputations have been of diminishing importance, thanks to Lister and the Employer's Liability Acts, etc. So that, as I learn from my friend Mr. Edred M. Corner, in 1913—the year before the war—out of 5,483 major operations at St. Thomas's Hospital there were only 34 amputations; a proportion of 1 in 161. The Royal Surgical Aid Society, which supplies appliances not only in London but also in the provinces, in 1913 supplied 529 artificial and peg legs and arms out of 41,483 appliances supplied in that year.

* Papers read at the meeting of the Medical Society of London, October 22nd, 1917.