CASES
IN
OPERATIVE SURGERY

PRICHARD

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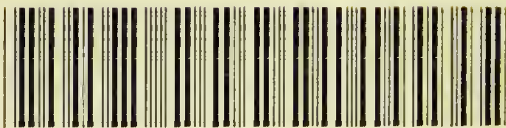
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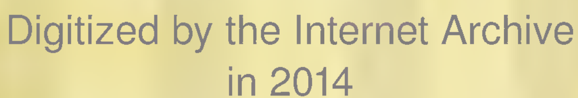
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TEN YEARS

OF

OPERATIVE SURGERY

IN

THE PROVINCES.

BEING THE RECORD OF

EIGHT HUNDRED AND SEVENTY-FIVE OPERATIONS,

PERFORMED FROM 1850 TO 1860.

BY

AUGUSTIN PRICHARD, F.R.C.S.,

SURGEON TO THE BRISTOL ROYAL INFIRMARY, ETC.

PART I.

COMPRISING 639 CASES.

Reprinted from the BRITISH MEDICAL JOURNAL.

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PROVINCIAL OPERATIVE SURGERY.

I PROPOSE under the above head to lay before the readers of the BRITISH MEDICAL JOURNAL a complete but brief account of ten years of operations. This will include those operations which fell to my share during that period as one of the five surgeons of the Bristol Royal Infirmary, and will therefore represent as nearly as possible one-fifth of the cases occurring there in that time, with the addition of the usual small proportion met with in private practice.

Of the more important operations, every case, whether successful or otherwise, will be noted; but of the minor ones, a few have slipped away for want of accurate notes taken at the time of their occurrence. The whole number of each kind of operation is too small to supply any safe basis for statistical results, supposing that medical and surgical statistics were ever useful; but I think that those of our associates who are employed in a like occupation will feel sufficient interest in this and the following papers, to justify my publishing them; and I am not without hope that they may be even useful; for every surgeon with a moderate amount of practice, whether among the poor or rich, must be the depository of some truths worked out by his own observations, or some curious results of his own experience, which, if they were published, would be new to most of us; and it cannot be doubted that a vast store of valuable medical knowledge lies concealed, especially in the remoter country districts, and that the greater part of it is lost to the world and disappears at the same time as its possessors.

In the Bristol Royal Infirmary, where the great majority of the following cases occurred, there are nine surgical wards, and about fifteen hundred surgical cases are annually admitted as in-patients; and each surgeon has the charge of all the in- and out patients (including casualties) admitted every fifth week, as long as they continue to be under treatment. The cases of operations on the eyes were at the Bristol Eye Dispensary, as well as at the Infirmary, with perhaps rather a larger proportion in private practice. I am not aware of any particular advantage to be derived by distinguishing in a report of this kind the hospital from private cases, and therefore they will all be classed together, unless it appears that some change in the result of treatment may be traceable to this element in the case.

Upon looking over the respective numbers under the separate heads of the diseases, treated by operative measures, it will appear that some of the less important cases, which are generally considered to be of frequent occurrence, are represented by very small numbers; for instance, I note more amputations of the thigh than operations for hare-lip, and more operations for strangulated hernia than for fistula *in ano,* and thus no criterion is afforded of the comparative frequency of these disorders, because cases involving the slighter operations are treated by the practitioners under whose care they first come, and also of a considerable number no accurate notes or records have been kept.

A retrospect of only these last ten years during which I have been surgeon to the Bristol Royal Infirmary, and the necessary examination of my notes of the operations I have performed there and elsewhere during that period, have shown very clearly not only that the science and art of surgery are progressive, but that they make rapid and important progress, and that even in this time numerous valuable improvements have been introduced, and the public who derive the chief benefit of hospital experience are not sufficiently impressed with this fact, nor is it sufficiently urged upon them as an argument for giving liberal pecuniary aid to these truly English establishments.

In the following report, by far the greater number of the more important operations were performed while the patient was under the influence of chloroform, or chloroform with

ether or alcohol, or after the application of the freezing mixture of pounded ice and salt, and unless there is anything particularly noticeable upon the subject of anæsthetics it will not be alluded to in the account of each individual case. I refuse chloroform in the lesser operations, as squint and cataract cases and the removal of tumours, and the minor amputations, and wherever ice and salt can be conveniently applied.

Some of the cases have been described before in the pages of the JOURNAL, but not in a connected or systematic way; and therefore I make no apology for briefly introducing them again in the order into which they will naturally fall; and lastly, to conclude these few introductory remarks, although I do not wish to provoke criticism, it is perhaps best to say that I hold myself solely responsible for all the opinions and methods of treatment described in the following cases, as well as for any remarks I may make upon the published reports and surgical papers of other writers.

The arrangement of the cases in a sufficiently intelligible order is very simple; and the following classification has been adopted, as being convenient and inclusive:—

1. Operations on the Face, Tongue, Palate, Neck, and Chest.
2. Operations on the Abdomen and Lower Part of the Intestine.
3. Operations on the Breast.
4. Operations on the Genito-urinary Apparatus.
5. Operations on the Eye.
6. Autoplastic and Orthopædic Operations.
7. Excisions of Diseased Joints and Bones.
8. Operations involving the Vascular System.
9. Tumours.
10. Amputations.

I.—Operations on the Face, Tongue, Palate, Neck, and Chest.

Under the first head is comprised a formidable list; viz., Hare-lip; Cancer of the Lip; Cancer of Tongue; Staphyloraphy; Epulis; Polypus Nasi; Tracheotomy; Suicidal Wounds of the Throat; and Tapping the Chest.

Hare lip. In performing this operation, I use a strong and sharp pair of scissors, and German-silver pins, such as were used so freely (if they were not introduced) by the late Professor Dieffenbach of Berlin. The number of cases is eleven, all of which were successful, with the exception of two, where a slight aperture remained above. They will require but a very brief description.

Case i. J. M., aged 25, a strong labouring man, with single hare-lip of the right side. The fissure extended completely up to the nostril and was remarkably even and wide. He had the power, which I have noticed in other cases, of bringing the sides of the fissure into close contact, and of pressing them firmly together. I have seen no explanation of the mechanism of this action; but I believe that it is performed by the associated action of the *orbicularis oris* and the *depressor labii superioris*, supposing that a slip of the latter muscle is distributed upon each side of the fissure. The opportunity of verifying this supposition by actual dissection must be very rare; but should it occur, I hope it will not be neglected.

Our experience in the use of chloroform was obviously at that time not so great as it was afterwards; and some was given to him whilst he was in a sitting posture, on March 12th, 1850. As this was the first operation I had been called upon to perform publicly—*i.e.*, in the theatre of a hospital, with numerous spectators—I was anxious that, although it was a minor operation, everything should be conducted orderly and quietly; but, after a brief inhalation, he leaped up in a kind of frenzy, like a medical student under the influence of laughing gas, and began fighting and kicking, spitting and swearing, and hitting out so effectually, that for a moment or two he cleared a space around him: he was, however, immediately overpowered by numbers, and lifted upon the table, where I at once proceeded to operate.

The section on either side was *upwards* and *outwards* through the red part of the lip, and from that point *upwards* and *inwards* to the top of the fissure, so that the line of incision presented an obtuse angle on each side at the point where the red part of the lip joined the rest of the skin; and thus when the line was straightened by the application of the sutures, it was longer than the straight edge of the fissure was, and thus a notch below is to be obviated. Two pins and twisted sutures were used, and a single point of the interrupted suture at the surface of the lip.

On the third day,* I took out the upper pin and the thread suture; and on the fifth, I removed the lower pin, which had been passed opposite the upper margin of the red part of the lip, and it was found altogether healed.

Case ii. J. W., aged 15 weeks. Single hare-lip of the right side, with cleft palate and prominence of the maxillary bone of the same side.

In this instance, I made one straight and one angular incision, so as to cause them to correspond, and it was further necessary to divide the frenum of the lip. Two pins were used; the first of which was removed upon the fourth day, and the second upon the fifth. The union above was not complete at first, but granulations sprang up, and it healed entirely.

Case iii. F. M., aged 2. Single hare-lip of the right side, with cleft palate opening into each nostril, and with prominence of the bone between the fissure and the median line.

I removed the prominent portion of the superior maxillary bone with a bone nippers, and after applying lint steeped in turpentine to stop the bleeding, I operated as usual. Two pins were used.

On the fourth day I removed the upper pin, and on the fifth day the lower, and found it all evenly healed.

Case iv. J. T., aged 6 weeks. The operation was performed as usual on February 1st, 1853, and two pins were used; on the third I removed the upper pin, on the fourth the lower, and found the wound healed.

Case v. D. M., aged 5 months. Single hare-lip on the right side, with cleft palate and slight projection of the jaw in front.

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* Where the days are thus specified, third, fourth, etc., the day on which the operation was performed is counted as the first.

Two pins were used, the first being withdrawn on the fourth day, the second on the fifth, and he was discharged cured with an excellent lip within a week of the operation.

Case vi. A. F., aged 9 months. Hare-lip of the left side, with a fissure extending through the greater part of the hard and soft palate, and with a wido gap in her lip. I was obliged to separato the lip freely from the jaw at first, and then the steps were as usual. Two pins were used. On the fourth day, I removed the upper pin, but while I was applying a piece of plaster to support the lip, it gaped open and bled, and I could not bring the sides in contact. I removed the lower pin on the sixth day, and found the lip united at this part. She went out with a hole above through the lip, and after a time I operated again upon the same case, paring the edges with a cataract knife, and bringing them together by a pin. She was much improved by this, but an aperture existed above when I last saw the case, and this was one of those to which I alluded when I said that all were not absolutely successful.

Case vii. W. C., aged 25, had been operated on as a child, but as in the last case, an aperture remained above, and he came up from the country to have it rectified. I trimmed the edges, and passing in a long pin, brought the parts together, and obliterated the hole. On the fourth day I removed the pin, and found that the sides had remained in contact, although it was not quite healed. He went home on the sixth day, with the lip going on well, and well satisfied with his improvement.

Case viii. E. M., aged 4 years. Single hare-lip of the left side, with great prominence of the jaw of the right side in front, and fissure of the palate throughout. In this case it was necessary to separate the ala nasi of the left side and the lip from the subjacent bone, and to free the lip on the right side in like manner before the parts could be at all approximated. I then made the usual angular incisions to remove the margin of the fissure, and brought the sides together with two pins, and a fine suture below. There was considerable hemorrhage. On the third day I removed the thread, on the fourth the upper and on the fifth the lower pin, and found that all had healed well, and that there was less deformity about the left nostril than appeared probable in my first examination of the case. A few days afterwards, a little ulceration appeared at the part

where the lip had been traversed by the pin, but it soon healed.

Case ix. L., aged 4 months, with double hare-lip and protrusion of the intermaxillary bone, so that the portion of skin intended by nature for a columna nasi and the central part of the lip projected in a line continuously with the tip of the nose, being supported by the globular projection of bone. The first steps were to separate the central piece of skin from the subjacent bone, and to remove the prominent portion, which was round like a marble. A good deal of hemorrhage followed, so as to require a ligature. I then trimmed the edges, as well as the tip of the central flap, and brought the lip in place with pins as usual, passing the upper one through the flap, which was drawn backwards horizontally, so as to make a columna nasi.

In this case the pins remained in place for a week, when they were removed, and the result was satisfactory.

Case x. H. B., aged 4 years, with double hare-lip, fissure of the palate, and projecting intermaxillary bone with two teeth. In this case I dissected away the central flap from the subjacent bone, and loosened and partly pressed backwards the prominent portion. At a subsequent operation I operated on the lip, and brought it together as usual, and it united fairly, but not entirely, for when he went out, there was an aperture at the upper part. This boy, now eight years of age, has recently been readmitted under one of my colleagues, and has undergone another operatiou to relieve the remaining deformity. The edges of the hole have been pared and the lip brought together, but it did not unite. The surface, however, began to granulate, and the aperture closed.

Case xi. Aged 7 months, with double hare-lip, cleft palate throughont, and prominent intermaxillary bone, from which two teeth were on the poiut of appearing. The central portion of skiu was, as in Case 9, continued in a straight line with the nose. I operated and removed the bone, waiting a quarter of an hour for the cessation of the hemorrhage, and then trimming the edges, brought the parts together as before, preserving the central bit of skin for a *columna nasi*, and using two pins. The child lost a great deal of blood, and appeared quite blanched. I removed the pins after the expiration of the usual period. The greater part had united, but the flap was loose,

and moved up and down when the child cried. I brought the parts in contact as well as I could with the aid of some adhesive plaster, feeling vexed at what I looked upon as a partial failure, but I was agreeably surprised to find that granulations sprung up and the parts cicatrised in excellent position, and the case terminated satisfactorily.

REMARKS. It is generally said that hare-lip is more frequent upon the left side than the right, but of these few cases, five were upon the right, two on the left, three on both sides, and of the side affected in one no record was kept. The eldest was twenty-five years old, and the youngest six weeks. No fewer than six had cleft palate and prominent bone; and upon this point my belief is, that the greater frequency of cleft palate in infants, as compared with adults, is due to the cure of the hare-lip cases. We know how the mere weight and slight permanent pressure of the lips keep the teeth in their proper place, and how they project when the pressure is removed; and I believe that when the natural firmness is given to the lips and cheeks by the early cure of the malformation, the two palate processes of the maxillary and palate bones gradually approach one another, and the scar on the cured lip is often the only memorial of a former hare-lip and cleft palate.

Cancer of the Lip. The number of cases of cancer of lip was nine. In all, the V-shaped incision, more or less modified according to particular circumstances, was made with a scalpel, and the German-silver pins were used. A very short account of each is all that will be requisite.

CASE XII. G. J., aged 26, a weak subject, much accustomed to smoke, had a large ulcerating projection on the lower lip near the left angle of the mouth for six months before his admission; and it was at that time becoming fetid. The disease was removed freely in the usual way. On the fourth day I removed the lower of the two pins, and on the fifth day the upper one. The small separate point of suture which I had inserted in the red part of the lip sloughed out and was lost. The wound was healed, and he went out on the sixth day after the operation, with an excellent lip, but with some swelling of the glands of the neck on the same side as the disease of the lip, and this had existed on his admission. I never saw him again.

CASE XIII. S. B., aged 56, admitted with cancerous tumour

of the lower lip, of eight months standing. It was distinct from the healthy part of the lip, and in an ulcerated state.

I removed the disease, and inserted three pins. On the third day I removed two lower pins, and on the fifth the upper, the string of which had caused some slight sore on the lip from pressure. The wound had healed entirely, and he went out in a few days.

Case xiv. C. D., aged 64, apparently healthy, had suffered from cancer of the lip for some years before I saw him, and the disease had attained a considerable size, that is, from one angle of the mouth to the other there was a space of three inches and a half, and the width of the tumour alone was two inches and a half.

After removing the diseased portion, I was obliged to separate the lip freely from the jaw by cutting through the mucous membrane on each side where it passes from the lip to the bone, otherwise the great gap could not be brought together. It was, however, done satisfactorily by means of three pins and a silken suture through the red part of the lip. The whole was supported by adhesive and bandage, for although it fitted remarkably well, it was very tense.

On the third day I removed the lowest pin and the silk; on the fourth, the middle pin; and on the fifth day the upper one. In this case also the thread cut a little into the lip, but the union was complete. He went home after about a fortnight quite well.

Case xv. F. B., aged 54. The tumour was as large as a "cob" nut, and had been growing for two months. I removed it in the usual way, and he went out cured in a few days.

Case xvi. W. P., aged about 50, had suffered from cancer of the lip for some years, but he had an enlargement of the sub-lingual glauds previous to the disease in the lip. The ulceration was on the right side, and extended beyond the angle of the mouth and half-way along the lip. I removed the disease by cutting out a triangular portion, with the apex below, and inclining inwards towards the median line, making the outer cut a little curved, so that when the parts were brought into proper position, the two lines of incision were exactly of the same length. Three pins, and two points of ordinary suture were used to keep the parts together. He lost a good deal of blood and was very faint.

On the fourth day I took out all the pins but one, and on the fifth day the last one, and the union was perfect. He was dismissed cured on the eighth day after the operation.

CASE XVII. R. S. had suffered from cancer of the lip, occupying the middle third of it, for many months. After repeated trials by caustic, I removed the disease, the base of the V-shaped portion being an inch long, and brought it together by four pins. On the third day I removed two, and on the fourth the remaining two pins, and found it soundly healed. When he went out a few days afterwards, there was a very slight superficial sore upon the lip at the top of the wound.

This patient has returned with swelling and threatening suppuration underneath the chin, the scar made by the operation remaining perfectly sound.

CASE XVIII. P. C., aged 56, had the disease six months before he underwent an operation. The disease was situated at the left angle of the mouth, and occupied nearly half the lower lip. I operated by the oblique incision (as in Case XVI), and after separating the lip from the jaw, brought the parts in place by three pins and adhesive plaster.

On the second day I removed the middle pin, on the third day the lower, and on the fourth day the upper one, and found all perfectly healed. He went out cured on the sixth day.

The two remaining cases were not so satisfactory in their results.

CASE XIX. D. L., aged about 65, was admitted with a thickened and excavated ulcer of the lower lip, extending beyond the right angle of the mouth to the upper lip, and occupying the greater part of the lower lip. In this case I operated, and removed a slice along the lower lip below the diseased portion, continuing the incision into the cheek obliquely downwards and backwards; a similar cut on the upper lip joined the first at an angle, and thus the whole of the cancerous part was removed. I brought the edges tolerably well together with ordinary sutures.

The greater part healed well; but after the removal of the sutures, it was found that a portion was not united, and he was unable to retain the saliva in his mouth. He went home relieved but not cured.

CASE XX. A. B., aged 60, had suffered from a disease of the lip for nine weeks. It had grown very rapidly and was much

ulcerated, and occupied the middle three-fourths of the lip. I removed the greater part of the lip, forming a broad triangle, reaching by its apex down to the bottom of the chin. It was necessary to separate the soft parts from the bone for some distance on either side, and to use three pins and two ordinary sutures to keep the parts in complete contact. There was free bleeding. On the second day I removed the upper small suture, on the third the lower suture and two pins, and on the fourth the last pin; and a little pus oozed out on the removal of the pins. The union by the first intention was perfect; but in rather less than a month, a hard tubercle returned in the scar, and the disease rapidly reappeared, the patient declining to submit to any further operation.

Remarks. Epithelial cancer, wherever it occurs, is admitted to be the form in which this dreadful disease is curable if it ever is so; and I believe that of all the modes of cure the knife is by far preferable. One of the patients, upon whose lip caustics had once or twice been applied in vain, immediately after I had cut out the diseased portion and finished the operation, volunteered the remark that the pain of the knife and pins did not equal one application of the caustic.

In the case (No. xx) where the disease returned within the month, the carcinomatous growth had been unusually rapid in its previous development, having invaded three-fourths of the lip in nine weeks, yet I have always feared that although I cut away nearly all the poor fellow's lip, some seeds of the disease must have remained behind. It is very seldom that I have seen the recurrence of the disorder in the same part. A patient was admitted under one of my colleagues not long ago, suffering from extensive unhealthy ulceration and induration in the submaxillary region with threatened sloughing of the gland, and its nature was not easily determined at first, until casually a scar was seen on the lip and chin, and upon questioning him, it appeared that many years before (ten or twelve, according to the best of my recollection) a cancer of the lip had been removed, and the complaint had remained dormant in his system all that time.

I have also under treatment at the present time an old man, who has had an indurated and ulcerated surface near the inner canthus of the left eye, which is gradually yielding to the nitrate of mercury ointment and an occasional touch of the ni-

trate of silver. Seven years ago, he underwent a successful operation for the cure of a cancer of the lip on the same side, but the epithelial disease of the cheek has existed twenty years.

These cases afford an excellent illustration of the efficiency of the German-silver pins of large size; for they are very sharp and round, they produce no irritation, and are removed by a rotatory motion without any pain, leaving the threads *in situ*, as an additional protection; and, as will be seen by anyone who may take the trouble of reading the following cases, I always use them, wherever they are admissible, even in amputations.

Cancer of the Tongue. Case xxi. M. D.. aged 50, had a tumour on the left side of the tongue for nine months; it was round and hard, with definite edges, feeling like an extraneous substance in the tissue of the organ. After trying the effect of mercury upon it, without avail, I excised it, by laying hold of it with a double-hooked forceps (*vulsellum*), and passing a bistoury through the tongue, and removing it in a triangular portion by two cuts. Two vessels bled freely, but stopped spontaneously, and the wound was brought together by three sutures, which were removed on the third day, when the wound was found to be healed. The microscopic examination of the disease showed epithelium, cancer cells, blood corpuscles and muscular fibre, with numerous regular round cells, with granular contents and larger than blood corpuscles (probably developed and escaped nuclei of the cancer cells).

I never saw this patient after he left the Infirmary.

Case xxii. R. J., aged 59, was admitted with a hard tumour of the tongue, ulcerated, and with prominent edges, which had existed for some months.

I passed a large curved needle through the tongue, and tied a string tightly in front and behind the tumour. He suffered excessive pain. About the seventh day, under the use of a chlorinated lotion, the dead part separated and healed readily, so that he was reported "cured" when he left the Infirmary a month after the operation. His general health was improved. The "cure", however, was but of short duration. Within two months, he returned with a tumour as before, which I treated as before, tying it with strong fine whipcord, and notching the

tongue in front and behind to ensure perfect strangulation and isolation of the tumour. It separated and partially healed up, and he left with a very suspicious ulcerated place in the tongue.

After this, I heard that the disease returned rapidly, and that he died the death of bodily suffering which is the lot of patients suffering from this frightful malady.

Case xxiii. J. F., aged 37, was under my care at first for about five weeks, when I tried the effect of mercury, iodine, chlorate of potash, caustics (chloride of zinc, etc.), cod-liver oil, and all kinds of remedies, but in vain. He was suffering from a hard and thickened and ulcerating sore, extending from near the tip of the tongue about an inch and a half backwards. This I cut away deeply and freely, and the bleeding was considerable, requiring two ligatures. I then lessened the size of the gap as much as I could by means of two sutures, which came out in the course of a few days, and he went out with the wound entirely healed. This man was convinced throughout that he had a malignant disease, although the appearance was not so characteristic as it sometimes is, and at first I had doubts upon the subject. In a short time the disease returned, and grew rapidly, and proved fatal.

Remarks. Of these three cases, the disease returned very quickly in two that were in an ulcerated state when the operation was performed; the other was, at any rate for the time, and it may be altogether, cured. It is obvious that the earlier an operation is performed, the better. Besides these three instances of cancer of the tongue, I had a patient, aged nearly 70, who had a deep excavated sore, with hard edges and excessively fetid discharge, far back on the dorsum of the tongue. As operation was out of the question, I treated him by drawing the stumps of some teeth that appeared to irritate the sides of the sore, by tonics, stimulants, cod-liver oil, and the application of a twenty and afterwards thirty grain solution of the nitrate of silver freely to the surface. The hardness disappeared, and the wound healed. He went home, and remained well for a month or two, when the disease returned, and was treated again in the same way, with a like result. Some time afterwards, I heard that it had recurred a third time, and was likely to prove fatal; a result which has doubtless taken place long ago.

Staphyloraphy. The cases of this operation which I have to narrate would appear, in a strictly scientific classification, among the operations for the removal of congenital deformities, but being few in number, it is as well to introduce them here.

Case xxiv. E. G., aged 24, had a scar on his lip, the remains of an old operation for hare-lip, and he had a fissure extending from just behind the alveolar process backwards through the uvula.

After he had taken, for the support of his system and the upholding of his courage, a profuse meal of beefsteak and beer, I operated by paring the edges, and bringing the soft palate together by two silken sutures. There was very little tension, and the union was complete as far as the sides were in contact, and even afterwards the granulations still further lessened the aperture that remained. The stitches were taken out on the fourth day.

Case xxv. J. S., aged 26, with an awkward nostril, and a scar from a hare-lip operation, had apparently been a case of double hare-lip with prominent bone, requiring removal, and was operated on by a former surgeon to the Bristol Royal Infirmary, in the patient's earliest months. A fissure of the palate extended from the alveolar processes backwards.

I removed the edges of the fissure, and brought a considerable length of it into contact by means of four stitches; the tension not having been very great. On the third day I removed the lowest stitch which was really in the uvula, on the fourth the two next, and on the fifth the last. The parts had healed satisfactorily.

Case xxvi. E. G., aged 21, with cleft palate, but no trace of hare-lip. I pared the edges in the usual way (that is, by holding each extremity of the uvula in turn by a forceps, whilst I stripped off the edges of the fissure with one of the straight little knives generally kept in the case of tenotomy instruments), and introduced two sutures by means of a common small curved needle held in a pair of forceps. The parts came well together, and she was very steady. The next day the throat became extremely inflamed, but the parts were well in apposition. On the third, the throat looked sloughy and was fetid, and I removed a stitch. On the fifth day I removed the other stitch, and found that the sides of the fissure held together but loosely, and an aperture appeared on the anterior part. The

adherent portion grew narrower, so that on the eighth day I was in great uncertainty as to whether it would all break open or not. I had given her a little wine, and brushed the parts with a solution of nitrate of silver, and the wound healed; granulations sprang up, and the opening anteriorly lessened. I afterwards touched it with the galvanic cautery, and it became about the size of a shot. Some time afterwards, I touched the aperture very lightly with a piece of caustic potash, hoping to make it granulate and close, but this increased its size. I then pared the edges of this round hole and brought them together, to no purpose, for it broke open again, and now she has an aperture, of the size of a split pea, about half way between the incisor teeth and the uvula.

Case xxvii. A. H., aged 41, cleft palate and hare-lip scar. The fissure extended about half way through the hard palate.

The operation was as usual, and four sutures were introduced, the anterior one being very tense, and therefore I scored the palate with two cuts through the mucous membrane, parallel to the middle line. The mucous membrane forming the posterior pillar of the fauces was also excessively tense. The case failed completely, and in three or four days split open throughout.

This patient was very courageous and anxious to be cured, and therefore in six months time I operated again in the same way, with the addition of dividing tolerably freely the posterior pillar of the fauces; the result was the same; on the fourth day it had all burst open.

These two operations were performed before the metallic sutures came into general use, and it is not impossible that they would have succeeded.

Remarks. My experience of this operation, extending only over these cases, and one or two others that have been under the care of one of my colleagues, does not entitle me to say much on the subject; at the same time, considering the appearance which these throats have presented, when sewn up and when healed, considering also the loose way in which the fibres of the *palato-pharyngeus* are held together between the folds of membrane, and the fact that one or two fibres of a small muscle (as seen in the operation for strabismus) will produce a very distinct and marked effect, I do not believe in the division of the *palato-pharyngei* as a necessary step in this operation. My

success was three out of four; and in the fourth, it obviously was not muscular contraction, but absolute want of sufficient mucous membrane to fill the gap that caused the failure.

Epulis. Case xxviii. M. P., aged 17, admitted with a small firm growth on the gum opposite and against the right lateral incisor of the lower jaw. Caustics had been applied, and partial removal had been performed.

I removed it by incision, and afterwards cut a notch out of the alveolar process with the bone nippers. She went out cured in four days.

Nasal Polypus. Case xxix. A. B., aged 12, with polypus of the right nostril of a month's standing, not quite closing the cavity. I removed it entire with the forceps, with scarcely any hemorrhage, and she was cured.

Case xxx. A. S., aged 57, had not breathed through his left nostril for ten years. The polypus was visible in front and at the back of the pharynx. I removed it piecemeal with the forceps, until he could breathe freely on this side. The hemorrhage was considerable, but ceased on the application of cold.

Case xxxi. C. D., aged 30, had polypus in each nostril for many years; the right being almost obstructed, the left completely so. At the first sitting I removed the growth from the left side, and a small entire polypus from the right, but as it was not quite free the next day, I operated again and freed it completely.

Case xxxii. A. H., aged 50, with polypus of each nostril. It was removed from the left, leaving the cavity free, and he was so satisfied, that he declined any further proceeding. He has remained cured.

Remarks. This operation, which is rather rough in its nature, and disagreeable to the patient, surgeon, and lookers on, requires a certain amount of dexterity, and there is as much difference perceptible in the skilful or unskilful performance of it, as in other more important proceedings. A forceps, rough in its blades, and meeting at the points but not elsewhere, is the instrument, which must be used lightly and very freely, with due remembrance of the surfaces along which it may safely glide. After the removal of a polypus or a portion of it, I have never had any difficulty in introducing my little finger completely into the nostril to feel for the root of the growth.

Many of my cases were among the out-patients, and escaped the record from which these were taken. The second (xxx) was one of those growths extending into tho pharynx, where the ligature is practicable and admissible. It was in casos such as this that I have seen Professor Dieffenbach, when I attended his surgical clinique at Berlin in 1841, slit up the lip and nostril close to the median line, turn back the side of the nose, lip and cheek, and with a pair of sharp curved scissors snip away the growth from its base, and after removing it entire, bring the parts together with pins so thoroughly, that in a few days it was difficult to see the line of section. This mode of operating has, some years ago, been brought forward as a novelty in London. I believe the cases to be extremely rare in which such a dissection would be justifiable.

The microscopic examination of these growths shows epithelium of varied form.

Tracheotomy. CASE XXXIII. A. L., aged 7, had suffered severely in her throat from scarlet fever, and as the eruption was subsiding sloughing set in, and signs of suffocation came on. I was called at two in the morning to see her, and found her apparently moribund, and the surgeon who had been in charge of the case had not completed the operation of opening the windpipe. There was no time to lose, for she threw herself back as if she were dead; I therefore seized the trachea with a tenaculum through the tissues which lay upon it, for an opening in the skin had been already made before my arrival, and slit it up with a pair of scissors, when out rushed the pent-up air, allowing the heart and lungs a chance of acting once more. I enlarged the wound to introduce a piece of gum elastic catheter which I had brought in my haste, and a little blood found its way into the trachea, producing great irritation and temporary suffocation. She fell asleep in five minutes, and awoke when I introduced the silver tube that had been procured in the meantime, and then at once fell asleep again. At eight o'clock in the morning I found the tube choked with mucus, and removed it, placing a small slip of stick across the wound so as to keep it open. In this way she breathed fairly during the day, and was cheerful and able to swallow some milk, but at night I found her in a suffocating state, and with great difficulty enlarged the wound once more, and after a minute or two of great

anxiety as to whether she was alive or dead, I passed in the double tube, and she fell asleep. The apparatus to generate steam, with a long tube extending to her bed, was at once put into requisition, and kept at work for the next ten days. On the fourth day, after taking out the inner tube to clean it, a piece of false membrane forming a cast of the trachea and of a tubular shape escaped, after which the breathing was more free. The tube required to be cleaned at intervals varying from three to six hours, and I was obliged to keep two pupils with her day and night. On the fifth day she ate a mutton chop, and began to take some quinine. On the eleventh day we noticed the first signs of returning voice, and a day or two before that date some air had passed through the mouth. Her breathing being quiet, the tube was allowed to remain, and it became gradually closed with thick mucus, the respiration having resumed its natural course. On the thirteenth day I removed the tube. Her respiration was easy but slow, and her appetite excellent. The wound was almost healed, and her voice quite restored on the seventeenth day, and she was soon cured; and when I last heard of her, some years after the operation, she was well, and a very minute scar remained.

Case xxxiv. B. C., aged about 25, accidently inhaled through a tube the vapour of sulphuric acid, at nine o'clock in the morning. Symptoms of choking came on at once, and increased steadily and slowly all the day until evening, when spasms, with inability to swallow, occurred. His mouth inside was charred, partly black and partly white. I operated at nine in the evening of the same day, and as the case allowed of a more deliberate proceeding than some others, I tried the forceps (armed with pointed blades) known as Thompson's instrument for performing tracheotomy; with the undesirable effect of finding that I could press back and flatten the trachea with apparently no prospect of opening it. I then opened it with the aid of a tenaculum and bistoury, and introduced the double tube, through which he at once breathed readily and freely, with a marked expression of relief in his countenance. Ice was ordered for his mouth. From the time of the introduction of the tube he had no more spasms. On the third day, he was much improved, and could swallow easily; on the fourth, the charred epithelium separated from the mucous membrane of the mouth and pharynx, leaving the surface quite clean; on

the seventh day I removed the tube, and, finding he could breathe easily, drew together the wound in the trachea; and on the fourteenth, he was discharged cured.

Case xxxv. A. J., aged about 30, was suffering from chronic laryngeal disease of a syphilitic character, and the breathing was gradually becoming more difficult, until, one day, suffocation appeared imminent. I operated at eight o'clock in the evening, and experienced the greatest difficulty in inserting the tube; for besides the violent struggling of the choking patient, there was another obstacle, namely, a thick white deposit, like the contents of a steatomatous tumour, pressing in front of the larynx, and causing it to lie unusually deep. The tube was introduced through the crico-thyroid membrane as nearly as could be supposed; but the case was so urgent, that there was every fear of her dying upon the table before the operation could be completed. When the tube was fairly in the trachea, the pent-up air rushed out, having the odour of sloughy tissues, or of dead bone. Then immediately she breathed freely and easily; and all who were present were struck with the marked change in the expression of her face, from that of excessive and horrible distress to instant relief and ease; and instead of the frightful struggle that had been going on, in which the patient with death upon her side had been strenuously fighting against the efforts of the surgeon, she lay after the lapse of one minute in absolute tranquillity and repose. Were it possible to describe a scene like this with the pen, so as to give a vivid and photographic picture of what was passing, to a non-professional reader it would appear incredible and strangely exaggerated; but my experienced readers will be able to remember many a similar contest, in which they have come off victorious, and will recall the varied feelings of great anxiety, and of thankfulness and pleasure at the relief afforded by the successful issue of such an operation.

From this time she rapidly improved; and many sloughs separated, and came out of the opening from which the tube had been removed. The wound gradually closed, and she went out in the course of a month, breathing tolerably freely, but quite in opposition to the distinctly expressed advice of the surgeon under whose care she had been admitted, and in whose absence I had performed the operation just described.

Within a week after she left, she was brought back, in

a moribund state, having taken cold; and before anything was done she died of suffocation.

Case xxxvi. W. A., aged 51, a fine healthy man, had suffered from diphtheria for a week before I saw him; and at that time he was breathing fairly, that is, with some oppression, but without any very obvious signs of obstruction; his symptoms becoming moro marked, it was determined as a last resource to perform tracheotomy. Although a tall man, the space between the thyroid cartilage and sternum was short, and, probably in some measure in consequence of external irritants which had been freely applied, the softer tissues were unusually vascular. After opening the skin, I laid hold of the trachea with the tenaculum, and slit up two or three rings, when a few drops of blood trickled into the windpipe, and before I had fairly introduced the silver tube, so much choking came on that he fell back exhausted, and I was in great alarm lest he should be dead. Upon rapidly thrusting the tube into the wound in the trachea, and dashing cold water on his face, he breathed again, and we helped him back into his bed, where he lay quiet, breathing tolerably freely through the tube.

This condition continued for about fourteen hours, when he died, apparently exhausted, or poisoned by the disease, but breathing freely through the tube to the last. There was no *post mortem* examination; but I believe that the diphtheritic deposit had extended through the lungs, as we have so frequently found to be the case in children who have died of this disease.

Case xxxvii. A. B., aged about 50, with old syphilitic disease of the larynx, a patient in one of the medical wards, was suffering from a constantly increasing dypsnœa; and one day, as I was going into the infirmary, I received an urgent message to go and see him. I found him seated up in his bed, blue in the face, cold, perspiring, and almost pulseless, straining energetically but almost hopelessly for air, none of which passed beyond his glottis. I sent down immediately for the instruments to perform tracheotomy, in the absence of the surgeon whose patient he was, as the case obviously admitted of no delay; but no sooner had the messenger left the ward than the patient threw up his arms over his head and fell backwards, and ceased to breathe. He was now quite pulseless, lying still, and to all appearance dead. When the instruments were brought,

with the aid of one of my colleagues who had arrived in the meantime, I introduced the tube at once, but no blood flowed from the divided tissues. After blowing into the cannula and pressing upon the thorax, he made first an occasional feeble effort at inspiration, and then the efforts became more regular, gradually improving in power, until after a time, he breathed fairly, his pulse returned, and he opened his eyes; in fact, he had come to life again.

He lived on for a little more than a week, and then died apparently of some bronchial affection; and at the *post mortem* examination very little was found to account for his previous condition. The immediate cause of the sudden stoppage of his breath was probably an œdematous state of the *rima glottidis*, which had been relieved by the opening in the trachea, through which his respiration had been free.

Remarks. Besides these cases, I have on two occasions opened the windpipe when it was of no avail, the patients having been dead in each instance before the operation was begun. In one, an adult in the medical wards, who had suffered from great dyspnœa, I went down in the evening to operate, the case not having seemed very urgent in the earlier part of the day, and when I was going upstairs, the nurse came to say that the man was dead; and so he was, and no efforts of artificial respiration after I had placed a tube in his windpipe could elicit any sign of life: in this case there was a scirrhous tumour pressing on the larynx. I saw the other, a child, aged two years, about five hours after he had drunk some boiling water, and thinking it a severe case, I summoned a consultation. When we met, the patient appeared more distressed, but as the steaming apparatus, which I had ordered, had not been fully tried, it was determined to wait one hour, and operate if he was not distinctly relieved. As we were leaving the infirmary, we were recalled with the news that the child was dead; and I therefore hurried back, opened the trachea, and introduced a tube, and tried artificial respiration and galvanism, but to no purpose. In both these instances, the operation ought to have been performed earlier, and it might have succeeded, at any rate in prolonging the life of the first. They were, however, neither of them *apparently* more dead than the last case which I described (No. xxxvii), where the patient actually

came to life, and lived for a week, after being dead for some minutes.

I have no personal experience of this operation in croup, and therefore will express no opinion upon the subject. We have of course fatal cases, but they are rare; and I believe that the establishment of a steaming apparatus, and a bed with thick curtains, in which the patients are kept by the physicians in a cloud of steam, is of the greatest service as part of the treatment of these anxious cases. I have frequently used a similar apparatus, combined with other means, in private practice, and hitherto with complete success, having never lost a case.

The operation of tracheotomy is best performed by an incision through the skin with a common scalpel, and then with a tenaculum and sharp-pointed curved bistoury; but, as I have endeavoured to show in these cases, we are frequently called to perform it in the quickest mode, and must use what instruments come first to hand. In a young child, where the rings are very flexible and the trachea very small, it is anything but an easy operation; and I have on more than one occasion seen the tube thrust at first down by the side of the windpipe. The steady use of the tenaculum and greater deliberation in the performance of the operation will lessen the chance of this accident.

Suicidal Wounds of the Throat. I introduce three cases of wounds of the throat, because they bear a certain amount of resemblance to some of these cases of tracheotomy; although they cannot claim to be called instances of surgical operations.

Case xxxviii. J. P., aged 60, cut his throat one evening, inflicting a severe wound with a large knife, which penetrated above the thyroid cartilage and reached completely across his neck, cutting freely into the pharynx, and, I believe, severing the pedicle of the epiglottis. He lost a large quantity of blood, which streamed from the wound and from his mouth. The wound had been stitched up by a continued suture before my arrival. He was treated with opium and stimulants. The stitches were removed on the third day, and it was found that no attempt at union had been made; the divided tissues looking much like those of a dead body. His head was bent for-

ward, and a warm poultice applied; and under this simple treatment he gradually recovered, and went out in about a month cured of his wound, and, for the time at any rate, of his insanity.

Case xxxix. Mrs. P., aged 60, was admitted as my patient one winter's night, having just cut her throat with a dinner knife. She cut through the ala of the thyroid cartilage into the larynx. Sutures were also inserted in this case. She was quite maniacal, requiring to be strapped to the bed, as she tried to tear open the wound. The case had a most unfavourable aspect; but by careful nursing and nourishment she gradually mended, and in about four weeks the wound was healed, and she was discharged cured.

Case xl. J. S., aged 35, came in the day after the last patient. He had religious melancholy; and, in consequence of it, first tried to drown himself in a shallow brook near his house, and then he tried to cut his throat with a razor, completing the incision with a pocket-knife. He then tried to hang himself, but being discovered before he was dead, he was brought off at once to the Infirmary. He had cut through the thyroid cartilage and into the œsophagus; but besides appearing very melancholy and dull, he did not seem much the worse for his injury. He complained chiefly of the fluids he tried to swallow running out of the wound. I had the parts kept as much as possible in apposition, and granulations soon sprung up; and in less than four weeks this formidable wound had almost healed, leaving for a time a fistulous opening through which his tea trickled, but he gravely informed me that when he drank beer none came through. In the fifth week I passed a probe into this fistula, and it went readily backwards and upwards into his pharynx until four inches of the probe had entered. In a short time afterwards, he was discharged cured.

Remarks. The great majority of our cases of suicidal wounds of the throat have terminated successfully, and there has been a considerable number during the past ten years. I do not believe that union by the first intention ever takes place if more than the integuments has been cut through; and therefore the use of sutures, much as I recommend them in almost every other available case, seems to answer no useful end here. Attention to the apposition of the edges of the

wound by fixing the patient's head, and careful diet, with the use of brandy and opium, are the most important items in the treatment.

Paracentesis Thoracis. I have performed this operation three or four times, at the request of the physicians, for the relief of the chest in cases of *empyema;* all of them owed their origin to tubercular disease and were ultimately fatal. With the exception of the operation itself, their treatment was entirely medical; and particular notes of the progress of these cases would be out of place here. The operation is best performed by a lancet and trochar, using a gum elastic catheter to draw off the pus, and bending down its extremity until the open mouth is beneath the surface of the fluid which first flowed out. This simple precaution renders it quite impossible that air should pass into the chest through the tube, and is far better than any of the complex machines that have lately been elaborated to answer this end.

II.

OPERATIONS ON THE ABDOMEN AND LOWER INTESTINE.

The second subdivision of my cases includes operations upon the abdomen and the lower part of the alimentary canal; that is, hernia of various kinds, tapping the abdomen, and operations for fistula *in ano*, hemorrhoids, and fissure of the anus.

Hernia. In narrating the cases of strangulated hernia requiring operation, I shall arrange them according to their kind, namely, femoral, inguinal, and umbilical; describing under each head, first the successful, and then the fatal cases. Of the large majority of cases which were reduced by the taxis, I have no note. A few instances of the operation for the radical cure will be added afterwards.

Femoral Hernia. Case xli. F. H., aged about 30, had been the subject of femoral hernia of the right side for two years, the tumour having appeared suddenly one day whilst kneeling at church. Strangulation came on without any very marked effort, but pain and vomiting commenced at once. Calomel and opium were administered, and the patient was bled before I saw her. The loss of blood made her easier, and appeared to lessen the sickness. The tumour was as large as an apple. I operated about thirty-six hours after the strangulation occurred; and, finding that I could not pass the finger-nail or director under the margin of Poupart's ligament without opening the sac, I punctured it, and let out a considerable quantity of bloody serum. The intestine was very dark, but firm and polished. After dividing the stricture upwards, and exercising a little gentle pressure and manipulation, it was returned. I used two sutures and a compress and bandage. The patient was relieved of all distressing feelings directly the stricture was removed; and she recovered without a bad symptom of any kind, and was quite well in ten days. There

is nothing especially worthy of notice in the case, for everything was plain and straightforward, as if the descriptions in the surgical and anatomical books had been taken from cases in every respect similar. It was my first operation for hernia, performed at night, at some distance in the country, away from surgical support; and I was therefore very thankful to meet with no unusual difficulty.

Case xlii. D. C., aged 59, never wore a truss to relieve a hernial tumour of the right side, from which she had suffered for ten years, and which went back at first, but for the last few years had become permanent. The protrusion increased and became strangulated upon making a violent effort, and severe symptoms began at once. Attempts of various kinds were made to reduce the swelling, but without avail; and when I saw her, about sixty hours after the accident, the tumour was as large as an orange, hard, tense, red, and very painful and œdematous. The pulse was rapid and vomiting incessant. The case had indications of having undergone quite enough manipulation in the way of taxis, and I therefore operated; but, owing to the œdematous and tense state of the skin, I was unable to draw it together into a fold as usual. The sac was opened, and the stricture divided upwards and inwards. The contents were, besides a small quantity of dark bloody fluid, a coil of intestine quite black, but smooth and polished, and a considerable portion of omentum, some of which was hard and thickened, having obviously been in the sac for a great length of time. After returning the intestine, I tied the omentum in strips, and cut off the thick part of it, leaving the ligature hanging out of the wound, which was brought together by sutures. She was treated first of all with opiates, and soda water to relieve the vomiting, which still continued. On the second day, some flatus passed from the rectum, showing that the canal was pervious; but she still complained of abdominal pain, and vomited a quantity of green fluid. On the third day, she had an enema of gruel and castor oil, which acted freely, and she was better from this time; being, however, very weak. I gave her six ounces of port wine daily, with the aid of which she soon recovered.

This patient had a very narrow escape; for the œdematous condition of the integuments over the tumour was a sign of mischief within, and the persistence of the vomiting after the

reduction of the intestine showed that it had been so pinched that it could scarcely recover itself. The omentum must have acted in a great measure as a protection to the bowel; and, but for its presence in the sac, the efforts at reduction would probably have produced even worse effects than they actually did.

Case xliii. J. P., aged 33, somewhat deformed in the limbs from old rickets, had suffered from hernia of the right side for some years; had never worn a truss; and, four days before her admission, symptoms of strangulation had appeared. She had been constantly sick and the abdomen was distended and tender. The tumour was of about the size of a walnut, and unusually moveable. After trying the taxis, under chloroform, and finding that it was useless, as it generally is in cases of hernia where the tumour is hard and moveable, for these conditions show that it is held by a tight and narrow neck, I operated, making the first incision by holding the skin over the tumour in a fold, by which means the superficial fascia and the skin are cleanly divided at first, and the subsequent dissection begins from a known point. After coming down to the sac, I opened it, and some fluid escaped, and what appeared to be intestine was exposed to view. It was smooth and shining, and of a pale colour; but it was quite impossible to pass my nail or a probe under the stricture; and, upon drawing firmly the divided edge of the sac, the convex surface of the tumour and the concave surface of the sac were found to be quite continuous with one another; and it was obvious that another sac was contained within that just opened. This was punctured, and some fluid escaped, and the intestine exposed. It was black, smooth, and polished; and, after some difficulty, I introduced a curved director, and divided the stricture, when the intestine slipped in at once. The after treatment consisted of opiates and rest. The bowels not having been moved by the sixth day, a small dose of castor oil was given; and this had the desired effect. She had retention of urine for three days after the operation, at which time she was menstruating. She was cured in about three weeks.

There are a few cases of double sac recorded by Chevallier, Dupuytren and Lawrence; and this one which I have just narrated, corresponds entirely to those described by these authors. The formation of the double sac is in the following way; the original hernial sac becomes cut

off by adhesion from the rest of the peritoneal cavity, and another protrusion takes place exactly at the same spot.

Case xliv. S. T., a little fat old woman, aged 60, had not been subject to hernia, but it came on suddenly two days before her admission, when, besides the tumour in the right groin, she complained of constipation, frequent vomiting, and general fever. After trying the taxis before and after the administration of chloroform, I operated, and, opening the sac, divided a very tight stricture; and the intestine, which was dark, slipped back at once.

She had an opiate immediately; but the bowels were open soon after operation. After this, she went on well for some days, still having a little fever, and the inguinal region still being tender; and on the eighth day the wound looked sloughy, some shreds of tissue hanging out of it. The next day, very fetid discharge, with air and semifluid matter having the appearance and odour of fæces, flowed out and she appeared easier. The bowels, however, were regular and this unnatural discharge ceased in a few days; and, in three weeks from the operation, the wound was nearly healed. She remained in the Infirmary for two weeks longer, and then was discharged cured.

The large quantity of fat in the subcutaneous cellular tissue rendered this operation a little more difficult than operations for hernia usually are, and the stricture was extremely tight. There was nothing besides the tightness of the stricture to account for the troublesome symptoms that followed, and they might have depended upon a small slough of the intestine, or, what was more probable, upon sloughing of the sac itself, an accident we occasionally meet with.

Case xlv. M. S., aged 48, had been accustomed to wear a truss; but one day it happened to be broken, and, whilst lifting a bucket, the tumour appeared, and she could not reduce it. I saw her on the third day, and then she was vomiting; her bowels had not been moved; and the abdomen was becoming tender. I gave her a turpentine enema, and applied ice over the tumour; and then tried the taxis, under chloroform, but without avail. I therefore operated and opened the sac, finding within a piece of distended colon, with omentum. The tumour was as large as the fist. After dividing the stricture as usual, so that the finger could pass up into the abdomen, I tried to

return the intestine, but in vain; and it required a second division before the hernia could be reduced. I also returned all the omentum, and applied three sutures, compress, and bandage; and ordered her an opiate at once, and again at night. On the third day, the tumour was as large as ever, the omentum having come down again. She slowly mended for a week afterwards, and then went home, because her husband was very ill.

Case xlvi. M. W., aged 50, had been the subject of femoral rupture of the right side for twenty years; and, eight years before I saw her, she had been operated on for strangulated hernia, and since that time the disease had been irreducible. Three days before I saw her, as she was coughing, the swelling increased and became painful and began to discharge; and, upon examination, I found a large and irregularly lobulated oval tumour extending across the upper part of the right thigh, and overlapping Poupart's ligament. The abdomen was tense and painful. Upon the outer side of the protrusion was an ulcerated hole, through which serum flowed freely. She had vomited, and the bowels had been confined. I operated, and opened the sac and integuments to the extent of nearly an inch; and, introducing my finger, found the intestine healthy in colour, and the opening into the abdomen free. She became extremely collapsed, and appeared to be sinking; and therefore I did not proceed further with the operation, but brought the parts together, and had her put in bed. The next day, she was much worse, her symptoms evidently being unrelieved. I therefore operated again, and made two separate cuts into the tumour; and found the intestine, of which a very large quantity was in the hernia, agglutinated together by recent peritonitis. This I thoroughly broke down with the finger; and, after bringing the wounds together as well as I could, I ordered her some calomel and opium. The first effect of the operation was, that she passed flatus *per anum*, giving great relief; and, after a good night's rest, she gradually recovered, the tumour still existing upon the upper part of the thigh, and the hernial sac and integuments being so firmly adherent to one another, and so thin from the pressure, that the peristaltic action of the contained intestine could be discerned within. She went out cured, supporting the tumour by a firm bag-truss.

The peculiarities of this case were the size and irreducible state of the hernial protrusion, in the lower part of which strangulation from some inflammatory condition had been set up; and this was relieved by the second operation which I performed upon her.

After this time, the patient came into the Infirmary, suffering from somewhat similar symptoms, which were relieved by purgatives; and about two years afterwards she died.

Case xlvii. D. F., aged 45, had suffered from hernia for many years, but never wore a truss. It had been down twenty-four hours before her admission, and moderate efforts at reduction had been made. The tumour was hard and painful, and the other symptoms acute. I applied ice, gave her chloroform, and used the taxis, but ineffectually; and therefore operated when strangulation had existed only twenty-six hours. The operation was straightforward in every respect, but the stricture was excessively tight. After the sac was opened, I had some difficulty in getting the blunt curved director underneath Poupart's ligament; but it was satisfactorily done at last; and, immediately upon the division of the fibres, the intestine slipped back. It was very black, but firm and polished. When she awoke from the chloroform, she expressed herself as relieved and easy. Sutures and compress were used. She went on well at first; but, the abdomen continuing tender, I ordered her a grain of calomel and a quarter of a grain of opium every three hours. On the fourth day after the operation the bowels were moved and she appeared better; but upon the seventh day a sloughy substance, which I supposed to be the sac, presented itself at the wound; and this was followed by some fetid yellow matter, which increased very much on the next day, and was obviously fæcal. This continued, at one time copiously, at another sparingly, for eleven days, when I gave her a dose of castor oil, and the bowels were moved naturally. The discharge from the groin continued to be fæcal until the twenty-second day after the operation, when it ceased finally; and in three days more the wound was healed.

This case of artificial anus is remarkable on several grounds. It shows that, in acute strangulation, sufficient damage may be done to the intestine to cause a slough in some part of its circumference in twenty-four hours; and that, under favourable circumferences, this aperture will heal of itself. The patient

had great difficulty in holding herself upright for a considerable time, owing to the adhesion formed between the intestine and the parietes. I believe that the hernial protrusion reappeared at the same place some time after she went out.

CASE XLVIII. M. C., aged 60, was admitted with a strangulated hernia, which had appeared first of all two days before, and upon which, the previous day, some forcible efforts at reduction had been made. She had constipation, vomiting, and pain in the tumour and over the abdomen.

In operating, I tried to divide the stricture without opening the sac, but could not succeed in doing so. In the sac was a quantity of bloody gelatinous serum and a coil of intestine, black, collapsed, and rough and ragged upon its surface. Upon touching the stricture with the edge of the bistoury, it gave way at once and the intestine went back. Believing that this patient also was suffering from peritonitis, I treated her with some calomel and Dover's powder, giving her at the same time a little wine, for her pulse was rapid and weak. Large quantities of serum flowed from the peritoneal cavity, and she suffered from retention of urine. She continued to take mercury and opium for six days, when the mouth became a little sore; and at the same time the pulse became quiet and the bowels were moved. She was cured in a few days afterwards. The effect of the mercury in this case was very distinct, and it undoubtedly aided in bringing about the good result that followed. The intestine was so much damaged by the efforts at reduction, that I was fearful it would slough; and I have seen many deaths from the intestine not recovering its vitality, when apparently it was not worse than in the present instance.

CASE XLIX. M. R., aged about 50, had been the subject of hernia in the left femoral region for some years. It had become strangulated four days before I operated, at which time she was very prostrate and weak, and constantly weeping and vomiting. In the sac I found omentum and a piece of black polished intestine: the latter was returned easily after the division of the stricture; the former was allowed to remain. She had swallowed a large quantity of purgative medicine before the operation; and when the stricture was relieved and the protruded bowel replaced, a troublesome diarrhœa set in, re-

quiring opium and other astringents. She made a speedy and satisfactory recovery.

Case l. T. B., aged 60, a farm labourer, fell from a hay-rick; and two days afterwards he found that he had a swelling in the groin, which was very painful. Vomiting commenced the day after the injury, and he was admitted as my patient on the morning of the fifth day, when I found that he had strangulated femoral hernia of the left side; the tumour being red and the skin œdematous. I cut down upon it; and, before opening the sac, a quantity of purulent matter flowed out, apparently from the cellular tissue outside the sac. The intestine was dark and tightly pinched in the opening; but the whole circumference of the bowel was not included underneath the stricture. Upon dividing the edge of Poupart's and Gimbernat's ligaments, the hernia was at once reduced.

This patient required stimulants after the operation, to keep him alive, for he was extremely sunk and prostrate. The bowels were moved on the third day, with the aid of two drachms of castor oil and twenty minims of turpentine.

A week after the operation, the sac sloughed out, and the wound soon healed. He suffered from retention of urine and required the catheter during the progress of his cure.

Case li. A. M., aged 52, the subject of hernia previously, found an increase in the tumour and a painful state of the abdomen sixty hours before I saw her. The vomiting was distinctly stercoraceous; and the rupture was small and hard, and in the left femoral region. I opened the sac, in which was some very dark fluid; and found a small coil of black polished intestine, which slipped back into its natural cavity immediately upon the division of the stricture. One suture, compress, and bandage, were applied. She recovered without a bad symptom, the bowels having been opened with castor oil on the fourth day.

Case lii. C. S., aged 30, had hernia for six years, and had worn a truss; but, seven hours before I saw her, her foot slipped a few inches off a plank, and the sudden jerk to the body brought down the swelling. It was in the right groin, and of the size of a walnut, very hard and painful; and the general symptoms were urgent. I operated about nine hours after the accident, and returned the intestine without opening the sac; and she appeared relieved at once. No bad symptoms

followed; the bowels were relieved by two drachms of castor oil on the third day, and she was soon cured.

The following four cases are instances where the operation did not succeed in restoring the patient.

Case liii. E. M., aged 69, with strangulated femoral hernia of the left side. The disease had existed for many years, but had been strangulated only twenty-four hours before I saw her. She had vomiting and tenderness of the tumour and abdomen, and attempts had been made to reduce it. Upon operating, I found in the sac a considerable portion of intestine, rough, dark red, and thickened; and it contained hard fæcal matter. After dividing the lower part of Poupart's ligament, I tried to reduce the mass, but was unable to do so until there had been a second division made internally, involving Gimbernat's ligament; and then it passed back readily. She was treated with opiates. The bowels were moved on the third day, the sickness had ceased, and she appeared to be going on well at first; but, after a day or two, she became weak and sinking, with some hiccup, tympanitis, and intermittent pulse; and she died on the seventh day after the operation.

The *post mortem* examination showed general peritonitis and effusion of coagulable lymph, producing partial adhesion between the contiguous peritoneal surfaces. Eight inches of the ileum, near the valve, were very dark; and, although none of it was sloughing, one part was much thickened and in a worse condition than it was at the time of the operation. A single tubercle, with a cicatrix of an old cavity, was found in the top of each lung.

Case liv. W. J., aged 56, had suffered from strangulation for about eighty hours before his admission. He was very dispirited and weak, and the tumour had been subjected to great pressure in attempts at reduction. I operated without chloroform. The sac contained a portion of very dark and rough intestine; and, after a division of the stricture, it was easily returned. Three sutures, compress, and bandage, were applied. I ordered him an opiate draught every three hours; notwithstanding which, his bowels were moved twice soon after the operation, and he seemed relieved. I ordered him a little wine, and in about twenty-four hours he seemed much better. He then suddenly began to sink, and died early in the morning of the third day.

A portion of small intestine was found, at the *post mortem* examination, to be very dark and adherent to the surrounding parts. There was no general peritonitis, nor effusion, nor any sign of injury about the ring. The intestine had not recovered itself, but it did not appear sufficiently damaged to cause death.

Case lv. M. M., aged 70, had suffered from hernia of the right side for some time, and it had been down and strangulated for ninety-six hours; but no efforts to return it had been made, for it had not been discovered. Upon operating, I made a very small incision, and found within the sac some dark fluid and a coil of black intestine, with a vein containing air upon its surface, and an abrasion of the peritoneum. The stricture was remarkably tight; but, as soon as it was divided, the bowel was very easily returned. Two sutures, compress, and bandage, were applied. This patient, having taken large quantities of purgative medicine with the view to relieve the constipation that had existed for four or five days, was taken directly after the operation with diarrhœa, and she gradually sank, and died on the sixth day. No *post mortem* examination was made.

Case lvi. M. A. F., aged 48, with strangulated femoral hernia of the right side, of an oblong form, projecting over Poupart's ligament, which had been strangulated for ninety hours. It was discovered to be the cause of her sufferings, but she would not submit to be operated upon before. The symptoms were very urgent, but she was in a weak and collapsed state. I divided the stricture fairly, without opening the sac; but could not return its contents, and therefore I opened it, and found a mass of omentum, and underneath a portion of rough black intestine, of a tolerably firm consistency. The finger passed up through the neck of the sac, which was not divided; and the intestine passed up readily. I also returned the omentum, which appeared to be thickened by pressure, but not very hard. She was treated with stimulants and opiates; but she did not rally at all, and died about twenty-four hours after the operation.

Post Mortem Examination. General intense peritonitis; the membrane being red, and the contiguous parts universally adherent; the lower parts of the abdomen and pelvis were full of serum and flakes of pus. The intestine that had been strangulated had not recovered itself, but it was not sloughy.

Inguinal Hernia. Case lvii. S. B., aged 38, was admitted with strangulated hernia of the left side, of about twelve hours standing. His truss had been broken. Upon using the taxis, the tumour became smaller, and appeared to have been reduced; for the patient was relieved, and the bowels were moved; but, twelve hours afterwards, the swelling returned, and he complained of great pain. I tried the taxis again, but ineffectually. Upon operating, I found that the sac merely contained omentum and a large quantity of fluid. The omentum was thickened and extremely congested by the pressure of the neck of the sac. I tied and removed a considerable portion of it, and brought the wound together as usual. This patient made a fair and speedy recovery.

Case lviii. W. H., aged 50, an extremely fat man, with inguinal hernia of the right side, which he has had twenty years, but has only worn a truss for two years. Symptoms of strangulation began about eighteen hours before I saw him, but they were not very urgent. He had been bled, and the taxis used, with warm bath and other means. After trying again to reduce the swelling, but in vain, I operated, and had to divide an enormous thickness of fat, so that the length of an ordinary director was only just sufficient to reach from the skin to the external ring. The sac was opened, and a small tumour was found in it, not having the usual black colour of strangulated intestine, and it appeared to be fixed in the canal. Finding the rest of the openings free, I brought the parts together, and ordered him some opiates. No very troublesome symptoms followed, but the wound healed slowly.

I do not believe that, at the time of the operation, this patient was suffering from strangulation; but the difficulties of the case were unusual, for he had symptoms of obstruction (vomiting and pain in the tumour), and the hard swelling in the inguinal region of the size of a walnut. There was also the previous history of an old hernia, which had come down suddenly the day before. In addition to this, the excessively fat condition of the patient rendered the case more obscure; and he lived some little distance in the country, where I could not see him again within twenty-four hours, a space of time it did not appear prudent to wait; and, under these circumstances, I believe that the plan adopted was correct.

CASE LIX. A. W., aged about 50, was admitted under my caro, suffering from strangulated inguinal hernia of the right side. His symptoms were acute, and had existed for forty-eight hours; and it is a remarkable fact that, exactly one weok before I was called to operate upon him, he had left the Infirmary curod, having been admitted under one of my colleagues, and operated on for strangulated inguinal hernia of the other side.

The hernia was of a large size, filling his scrotum on the right side. I made a small incision; and, after dissecting down to the sac, divided the stricture, which appeared to be formed by the external ring, without opening the sac. While, however, I was trying to reduce the rupture, my finger passed through the membrane, which was unusually thin and distended, and the fluid escaped. I returned the intestine, which was dark, but polished and firm, without any further division of the stricture. The patient had a slight attack of erysipelas round the wound, but recovered without any other drawback.

The following are unsuccessful cases of operation for inguinal hernia.

CASE LX. W. K., aged 19, had been occasionally subject to a hernial protrusion of the right side; it came down three years before this time, and again upon the morning of his admission, whilst he was at his work; and then it speedily became very hard and painful. I saw him within six hours, and found a round hard tumour in the right side of the scrotum, evidently occupying the tunica vaginalis; for the site of the testicle could not be discovered. The swelling was so circumscribed at the external ring, that I could confine it between my finger and thumb, and feel the component parts of the spermatic cord. His pulse was very quiet, being only 60; and he stated that he had passed flatus *per anum* since the occurrence of the tumour. He also had gonorrhœa, and there was no impulse on coughing. Being in some doubt about the nature of the case, I had him bled, gave him an opiate and a dose of castor oil to take in the morning; and thon, finding that matters were no better, performed an operation, intended to be exploratory, about twenty-four hours after the first signs of strangulation. There was a feeling of fluctuation about the swelling, and extreme thinness of the investing tissues, which made it look like a cyst; but, upon cutting through it, a piece of dark livid intestino pro-

truded itself, covered by a thin layer of omentum, containing coagula in its tissue. I divided the stricture upwards, and returned the bowel; but with some little difficulty, as the man was struggling violently from the effects of the chloroform. The testicle was seen at the bottom of the cavity. The patient never seemed to recover himself; his pulse became extremely rapid, and he died about fifteen hours after the operation.

Post Mortem Examination. A small portion of the calibre of the intestine was adherent to the ring inside; that part which had been strangulated was variegated in colour, black, purple, and soft, with white and yellow spots about its surface. No other morbid appearance was found.

The difficulties of this case were, the form of the tumour, its position in the tunica vaginalis, the absence of any history of congenital hernia, the existence of gonorrhœa, the passage of flatus, the quiet pulse, the patient's freedom from other general symptoms, and the want of any impulse on coughing. This latter sign was, however, only an additional difficulty when combined with the absence of fever; for a hernia really strangulated receives no impulse, being cut off from the abdominal cavity; but, under such circumstances, it is rarely the case that the general symptoms of strangulation are not manifested. The stricture was so tight that the vitality of the protruded part was speedily destroyed; and the patient's violence under chloroform, and intolerance of its effects, still further lessened his chance of recovery.

Case lxi. T. T., aged 74, was admitted with strangulated scrotal hernia of the right side. After trying in the ordinary way to reduce the swelling, I gave him chloroform, intending to operate, should I find that reduction could not be effected. After he had inhaled for a minute or two, I began to manipulate the tumour, and found that I could lessen its size; but my attention was suddenly called away to the condition of the patient, whose pulse ceased while the house-surgeon had a finger on the wrist, and all respiratory movements stopped at the same time. The old man appeared to be dead for half a minute; but the galvanic battery being at work upon an adjoining table, the handles were applied to his epigastrium and the back of his neck, and immediately he started into life, and struggled to sit

up. I then reduced the hernia, and he went out well in a few days.

Two years and a half after this date, when the patient was in his seventy-seventh year, he was again admitted under my care, with symptoms of strangulated hernia; and when I was called to him, about midnight, he was suffering from vomiting, severe pain in the abdomen and a very large and hard scrotal hernia. After trying the usual means it was determined to operate; and the death-like syncope into which the old man fell at the first inhalation of the chloroform at once reminded me of what I had not recognised before, namely, that I had my former old patient again to treat. I operated without chloroform, and opened the sac, finding in it adherent omentum and a considerable quantity of dark intestine, which latter was returned, and the wound brought together as usual. I gave him some opium and a little wine, and he went on well until the third day, when his bowels were moved; but, in the latter part of the day, the skin around the wound, and the side of the scrotum and penis, turned black, as if from some sudden sphacelus with effusion of blood; and he began to sink, and died the next day.

At the *post mortem* examination, a large slough was seen over the side of the scrotum, and the lower part of the abdomen and upper part of the thigh. The intestine was slightly adherent to the neighbouring parts, and seemed to be recovering itself. No attempt at adhesion in the wound.

In this case, the old man had not vitality enough to withstand the operation; and the feebleness of his circulation, which caused the sloughing of the integuments, in all probability gave rise to the alarming symptoms which chloroform produced in him.

Case lxii. E. W., aged 28, had been subject to hernia for many years, but upon this occasion it had been strangulated for *one hundred aud twenty* hours. He had, on admission, a little hard tumour in the left inguinal region, and suffered from stercoraceous vomiting to a large extent. When I operated, he was excessively feeble; in fact, almost pulseless. There was no fluid in the sac; the intestine was very dark, but not disorganised: and the stricture was very tight. The intestine was easily reduced.

The next day, he felt and seemed well; but the bowels had been moved three times in the night, although he had taken a grain of opium after the operation. I ordered him wine, and an opiate draught three times a day; and he slept fairly, and expressed himself as comfortable the next day; but he gradually became lower and weaker, and died in the evening of the third day.

The peritoneum in this case was injected, but no lymph was effused; the intestine was dark, but firm; the wound made in opening the sac and dividing the stricture had healed. No other morbid appearance was noticed.

This patient, although a young man, was worn out by the long continued vomiting and depression produced by a very lengthened strangulation.

Case lxiii. A. B., a farm labourer, aged 65, had been accustomed to live very freely, and had been the subject of inguinal hernia of the left side for many years. In addition, he had ventral hernia above the umbilicus, inguinal hernia of the right side, and also, what probably caused the rupture, a stricture of the urethra. The swelling had been down for three days, and he complained of much pain and sickness.

Upon operating and opening the sac, I found the stricture very tight, and about five inches of moderately dark intestine within. Some difficulty was experienced in reducing tho hernia. After the operation he did not appear to rally, and his pulse still continued weak and intermittent; and he suffered from occasional vomiting. His strength gradually and steadily failed, and he died on the fourth day from the operation.

The *post mortem* examination shewed nothing very marked. There was imperfect suppuration in the scrotum and along the cord, but no peritonitis, nor sphacelus, nor effusion of blood.

In this case, also, the damage done by the disease to a vital part was relieved by the operation; while the effect upon the patient's unhealthy condition was so great that he could not rally from it.

Case lxiv. G. D., aged about 35, a healthy labouring man, was admitted as my patient with an enormous scrotal hernia, in a state of strangulation which had existed only a few hours before I saw him. The tumour was on the right side, and was

very hard, tense, and painful, and considerably larger than the fœtal head at nine months.

Upon operating, when the sac was opened, I found a great quantity of small intestine, very turgid and black: there appeared to be a double stricture, formed of the two inguinal openings, which the weight of an old and large hernia had drawn opposite one another. They were tense and hard, like the rounded tendon of a muscle. After dividing them, I tried to return the intestine, and succeeded, after repeated endeavours for a long time. The patient was an hour under the influence of chloroform.

The operation was performed late in the evening; the patient was seen at 2 A.M. the next morning (that is, in about four hours), and again at 4 A.M, when the assistant house-surgeon, finding him covered up in bed, did not disturb him. When I called in the morning, he was dead, and had been so apparently for some time.

POST MORTEM EXAMINATION, about nine hours after death; the weather being very hot. The body was much swollen, discoloured, and disfigured; the face and neck dark purple, tumid, and crepitating; the skin about the wound, and over the abdomen, pelvis, scrotum, and penis, was purple and green; and some little blood was effused here and there among the muscles. *Two yards and a half* of small intestine were quite black, and this part was cut off by a distinct line of demarcation from the rest, and blood was effused into its tissues. He had, besides, air in the veins; a large thyroid vein, the internal mammary, the iliacs, the venæ cavæ, and the azygos, were distended with gas; the vena cava inferior looking like a piece of small intestine. Frothy blood was in the heart, and air in the auricles. The intestine was in such a state, that it was quite impossible that he could survive; but, undoubtedly, the immediate cause of death was the presence of air in his blood. He only took half an ounce of chloroform, and he rallied well after it. Whether the prolonged operation, or the chloroform, or the great damage done to the alimentary canal caused this state, I am quite unable to decide.*

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* Cases of death with air in the veins have been published by Mr. May of Reading, in the JOURNAL for 1857, pp. 477 and 663. Several deaths from chloroform have occurred, in which air was found in the veins.

Umbilical Hernia. CASE LXV. T. B., aged about 40, long the subject of umbilical hernia, which had in all probability been produced by the distension of his abdomeu from dropsy, was admitted with symptoms of strangulation that had existed about eighteeu hours before I saw him. He had been tapped three times.

After trying the taxis in vain, I operated, and was obliged to open the sac, in which I fouud a coil of small intestine, black, but polished. It went back immediately upou the division of the stricture, and a large quantity of serum flowed from his peritoneal cavity through the wound, which was afterwards brought together by suture, compress and bandage. Complete union by the first intention occurred, and not a particle of pus could be seen.

REMARKS. The number of hernia operations altogether is twenty-five, but they are too few for any satisfactory numerical calculations; in fact, in a disease so varied as hernia, where the cases differ so much from one another in almost every particular, I cannot understand how any point of practical value as to treatment can be deduced from numbers, and it is even difficult to see how any pathological facts can be established in this way. The principal points which can be gathered in the uumerical way from this series may be thus expressed :—

Of the twenty-five, fourteen were women, and eleven men; the eldest was 77 years old, the youngest 18 years; sixteen were femoral, eight were inguinal, aud one umbilical; seventeen occurred on the right side, and seven ou the left; in the successful cases of femoral hernia the average age was 48 years, whilst that of the fatal cases was 60 years; the average duration of the period of strangulation in the successful cases of femoral hernia was *fifty-two hours*, and of the unsuccessful cases *sixty-eight hours;* the average length of strangulatiou in the successful cases of inguinal hernia was *twenty-six hours*, and in the unsuccessful cases *forty-eight hours.* Four cases of femoral hernia died, out of sixteen that were operated on; while five cases of inguinal heruia died, out of eight operated on. The only case of umbilical hernia recovered. Three women died, out of fourteen operated on; and six men, out of eleven operated on. I subjoin a table of the fatal cases.

1. *Femoral Hernia.*

Sex and Age.	Period of Strang.	Side.	Remarks, and Post-Mortem Appearances.
F. 69	24 hrs.	Left	Peritonitis with lymph and adhesion. No recovery of the intestine; eight inches very dark.
M. 56	80 hrs.	Right	No recovery of the intestine that had been strangulated: no sign of inflammation.
F. 70	96 hrs.	Right	Diarrhœa caused her death. No *post mortem* examination.
F. 48	90 hrs.	Right	Intense peritonitis, caused by prolonged strangulation previous to operation.

2. *Inguinal Hernia.*

Sex and Age.	Period of Strang.	Side.	Remarks, and Post-Mortem Appearances.
M. 19	24 hrs.	Right	Strangulation excessively acute. He never appeared to recover from the chloroform thoroughly.
M. 77	24 hrs.	Right	Sloughing of the scrotum and penis, and integuments about the wound.
M. 28	120 hrs.	Left	Great depression and weakness; no recovery in the intestine.
M. 65	60 hrs.	Left	Suppuration about the cord. (Query, pyæmia?)
M. 35	12 hrs.	Right	Veins full of air: eight feet of intestine black.

The cases which we meet with here in hospital practice are, as a rule, very unfavourable; quite as much so as those met with in the London hospitals; for, after attempts at reduction and other treatment by the patient's own medical man, or by the surgeon of a poor-law district, all of which involves delay, they are frequently brought in many miles from the country, perhaps after a day or two's consideration, and again undergo examination by the resident surgical pupil and house-surgeon, before the surgeon of the week is called upon to operate. All this is inevitable; for we all admit that these attempts at reduction must be made; and really a large number of cases is in this way cut off from coming under the surgeon's knife, by the

return of the ruptures by the taxis, at one or other of the stages I have described.

To draw any guide as to the after treatment of any particular case of hernia from statistical observations is manifestly absurd, owing to the great variety in the cases; but there are a few points on which I should like to give an opinion.

As to the debated question of giving purgatives after the operation, while I am convinced that diarrhœa is much to be dreaded, aud we generally give opiates to keep the parts quiet and at rest until some repair or recovery has taken place, yet the opposite condition, if too prolonged, is also to be feared, not on its own account, but because it indicates that the intestine does not recover its function; and the converse of this proposition is also true, that when the bowels are naturally relieved two or three days after the operation, the patient will in all probability do well. To begin with active purgation, is to damage or destroy the patient's chance of recovery.

The intestine was returned without cutting into the sac in only two of these cases; but, as a rule, if such can be given, it is better to do so always; on the other hand, it is not unfrequently impossible to effect it, and in cases where strangulation has existed a long time, or old omentum is contained in it with the strangulated intestine, it is important to see the condition in which these organs are, and sometimes to remove the omentum. Upon looking over the causes of death as discovered by the *post mortem* examinations in these unsuccessful cases, we may say that two patients possibly died from the effects of the operation, namely, the old man (Case LXI), aged 77, whose scrotum sloughed, and another who had suppuration about the cord; one old woman died of diarrhœa and prolonged strangulation, and two from well marked peritonitis. I do not think that opening the sac had anything to do with the fatal result in any of the cases; in most of which the patient's death warrant seems to have been signed by the damage done to vital parts before the operation was performed. In two of those who did well, an artificial anus was temporarily formed by the adhesion to the wound and sloughing of part of the calibre of the intestine; but they both healed spontaneously, and in one of them the hernia returned exactly at the same place. I think it not improbable that these two

cases would have been reckoned in the list of deaths had the intestine been returned without any aperture in the sac.

The fact of the occasional *sloughing of the sac* during the progress of recovery does not appear to have been much noticed. It requires no special treatment; and, as the wound heals, the peritoneal cavity closes. It is easily intelligible, that a membrane so little vascular as the peritoneum, if squeezed out of its accustomed attachments and subject to severe pressure, should lose its vitality in the course of a day or two. In those old and rare cases where the stricture is caused by thickening at the neck of the sac, this would not be likely to occur.

In operating, I have always observed a peculiar sensation conveyed to the finger on opening the serous cavity, namely, a disagreeable feeling as of satin, and I have never yet been deceived respecting it; so that I should, in a case of doubt, take it as a guide as to whether the sac had been opened.

The fact that, in cases where strangulation exists, no flatus passes *per anum*, is occasionally a valuable aid in forming a diagnosis, and it is a question that should always be asked; but I do not think it is sufficiently noticed among the symptoms of the disease.

In several cases I gave the patients a little blue pill and opium, where there were signs or threatenings of peritonitis, and in one it was necessary to continue it until the mouth became sore, when a very marked improvement took place, and whenever it was administered I had reason to believe that it was of service; and hitherto I have seen no reason to doubt the lesson inculcated by our teachers twenty years ago, that to give mercury with opium, and not brandy, is the best mode of treatment for inflammation of the serous surfaces.

The Radical Cure of Hernia. CASE LXVI. T. B., aged 42, had been the subject of scrotal hernia at the right side for some time: he was a patient in the medical wards, and had been suffering from chronic rheumatism. He did not complain much of the inconvenience of his rupture, and, in fact, he appeared to take all his physical ailments very quietly; but I recommended the operation and he consented, and this was the first performed in this neighbourhood.

I introduced the wooden plug covered with some compound iodine ointment, which I thought would be likely to excoriate

the skin sufficiently, and completed Wützer's operation without any difficulty.

The needle and plug were withdrawn on the seventh day, and the skin remained in its new position. A compress and bandage were applied; but he had an attack of erysipelas of the part, which rendered it necessary to remove all pressure, and to apply the tincture of iodine. I gave him some iron internally, and he soon mended and seemed well, the plug of skin remaining *in situ* and the redness having disappeared. I ordered him to be bandaged and to get up; but he got up first, and walked about the ward without the bandage, and I thought it was all right. The old man (for such he seemed to be) expressed himself as quite well, and asked leave to return home to his friends in Wales; to this I consented, and took him into the operation room to examine him once more, when, to my dismay, I found his scrotum distended by the hernia that had come down again. It was replaced, and a truss applied, which kept it well up; and he went away expressing much gratitude for the operation I had performed on him, and much better satisfied with it than I was.

Case lxvii. H. B., aged 2½ years, had congenital hernia of the right side, which was so large that trusses would not keep it up. The operation was performed in the usual way, without chloroform, the boy being perfectly steady, and not crying or shrinking at the passage of the pin through the tissues. The wooden plate was screwed down tolerably firmly over the pin and plug, which were withdrawn on the ninth day, and a bandage and compress applied.

After about three weeks, a little swelling of the scrotum appeared, and disappeared again at once, so that I was afraid that the hernia had come down again. A truss was fitted, and I kept him in the Infirmary playing about the ward for three weeks longer; there was no sign of any return of the disease, and therefore I sent him home.

Case lxviii. A. R., aged 8 years, was the subject of a large congenital hernia of the left side.

In the interval between this case and the last, one of my colleagues had performed some operations of this kind, with a fair amount of success; but not feeling quite satisfied with the results, I determined in this present instance to operate

by means of the curved tube and silver wire recommended by Mr. R. Davies, of Birmingham.

After introducing the tube fairly into the canal, so as to press the end of it against the posterior surface of the abdominal muscles, the needle was thrust through with some little difficulty and the silver wire withdrawn with the needle and tube into the inguinal canal. The plug of skin was kept *in situ* by a small piece of vulcanised india-rubber fixed by a split shot, and another similar arrangement was made upon the surface of the abdomen, when the wire had been drawn up sufficiently firmly.

The next day I found him very ill, feverish and vomiting. The lower shot had slipped a little and required readjustment.

On the third day he had great abdominal tenderness and some redness around the outer puncture, and on the seventh there was a free discharge of pus from beneath the india-rubber. Upon examination the skin appeared to have sloughed to a small extent, and therefore upon the following day I removed the wire and shots, and applied, by means of a camel hair brush, some blistering fluid to the canal of skin. A deep hole appeared above through the abdominal parietes, filled with pus which ebbed and flowed with each inspiration and expiration.

I gave him good diet and a little stimulus, and the wound healed, and the parts appeared firm. A truss was fitted and he got up, and after a time went out well. He was quite well six months after the operation, and remains so now.

The patient, in this case, went through so many perils, of peritonitis, and sloughing, and suppuration, that I determined in the next to return to the wooden plug.

Case lxix. J. M., a strong healthy man, of the age of 22, was admitted under my care with strangulated inguinal hernia of the right side, accompanied by much pain and vomiting. It had been strangulated only two hours, although he could never keep it up when at his work. I ordered a full opiate, and the application of cold; and on visiting him again in an hour, I found, instead of the tense and hard swelling in the scrotum, a soft tumour, which disappeared on the application of very slight pressure. He was beginning to feel the effect of the opium, and the spasm became relaxed.

A week afterwards, I performed Wützer's operation, smearing the plug with blistering plaster; and it was withdrawn on the eleventh day. A compress and bandage were applied, and afterwards his truss, which kept the parts well in position.

This patient has had no difficulty in keeping up the hernia afterwards, but I was told that some swelling had occasionally returned; he expresses himself as very much benefitted by the operation.

I have no doubt but that the operation for the relief of strangulated hernia, might be made less frequent even than it is at present, if patients would, on the first sign of strangulation, submit themselves, as this man did, to judicious surgical treatment, which would consist in opiates, the horizontal position, cold, and the removal of all pressure and irritation from the tumour for a few hours. When once a hernia has been subjected to any rough attempts at the taxis, it seems to be irritated to resist them, and an operation becomes almost imperative.

Remarks. These results of the operation for the radical cure of reducible inguinal hernia are certainly not what we might have hoped for, considering the favourable reports given of the first operations in Germany and England; but one or two of the cases were the first done in this city, and experience was wanted. The operation thus performed, seems to be safe as far as life is concerned; which cannot be said of that modified form called "Wood's operation," in consequence of which, at least one death has occurred. It used to be a surgical maxim, that no cutting operation for the radical cure of hernia was justifiable, because of the danger to life; and although times are changed, and the attention of surgeons is again forcibly directed to the treatment of this disease, in my opinion, the same maxim holds good.

The cause of failure which was most prominent in the cases described above, was the non-adhesion and return of the plug of integuments, and this appears so likely to happen, that some other step, besides blistering the surface, should be taken; and for this purpose the instruments have been altered by different surgeons. I think it would be worth while, on the withdrawal of the wooden plug, to strip a thin slip of the integuments away from the orifice of the cutaneous canal, and put a pin through the parts to get them to unite, and close the aperture completely.

While operating upon one of the boys, I noticed a physiological fact of some practical importance in the surgery of hernia. When he was lying quiet on the table, I could easily pass my fore-finger through the external ring into the inguinal canal without any particular obstacle; but, on seeing the instrument, he became alarmed and began to cry, and struggled so as to raise his head from the pillow and contract forcibly his abdominal muscles. Upon attempting to introduce my finger again while he was in this state, I found the opening closed, the pillars of the ring being in contact with one another, and I had to wait until he was reassured and quieted, before I could do it.

Until I felt this, I was not aware that the contraction of the muscles could have so great an effect upon the ring as to close it, and it demonstrates the value of the well-known direction given in surgical books about relaxing the muscles in attempts to reduce a hernia. The action is performed by the *obliquus externus*, aided, of course, by the fibres of the *obliquus internus* and *transversalis*, which are attached to the inner pillar of the external ring and the lower part of Poupart's ligament. The internal abdominal ring is, no doubt, closed by the same contraction, and it is more intelligible that it should be so. Thus, the same muscular contraction by which we make any straining effort in some of the every-day movements of the body completely closes the openings, and by resisting the pressure from above prevents the formation of hernia.

Paracentesis Abdominis. All the operations of tapping the abdomen which I have performed have been at the request of some physician, under whose care the patient had been; and I have kept no record of the disease, or results of treatment, nor indeed of the number of cases.

We now frequently tap the abdomen with the patient in the reclining posture, the abdomen projecting over the edge of the bed; and although it is a little more difficult in this way to get rid of the entire quantity of fluid, it saves the patient from the disturbance and faintness caused by the upright position, and the whole proceeding is of a much less formidable nature.

Fistula in Ano. Case lxx. P. McC., aged 63, a tall thin Irishman, with a little cough, had been the subject of fistula for a long time. Two sinuses ran from the margin of the

sphincter, one forming the true fistula communicating with the rectum, the other running backwards towards the os coccygis. I divided both with a sharp-pointed bistoury and a steel director, and had them dressed from the bottom. In twenty days the wounds had healed entirely.

Case lxxi. J. W. had old standing fistula. I could not find the internal opening of the fistula, but as there was merely a thin mucous membrane over the point of the director just above the sphincter, I thrust it through, and bringing it out at the anus, slit across the muscle at once. This patient went out well in a month.

Case lxxii. J. B., aged 40. The fistula was situated posteriorly to the anus, and ran up by the side of the rectum, for a considerable distance. I divided the sphincter in the usual way, and he went out well.

Case lxxiii. A. C., aged 50. I divided the sphincter as usual on a director, and he went out cured in a week.

Case lxxiv. B. D., as the last case.

Case lxxv. R. B., a fistula running in two directions. I laid it open freely both ways and it speedily healed.

Remarks. The cases on which I operated were all of them favourable, and they were all cured. I use a sharp curved bistoury and a straight *steel* director, and do not give chloroform. I never find any insuperable difficulty in bringing the point of the director guided by the finger in the rectum, out through the anus. The prossure and tension of this is considerable, and is of course productive of some pain, but it much facilitates the next step; namely, the division of the parts, for the director is kept *in situ* without being held, and the bistoury may be run along the groove in the tenth part of a second. The subsequent dressing is by strips of dry lint or the nitric oxide of mercury ointment.

Internal Hemorrhoids. Case lxxvi. A. B., aged 30, a married woman, who had lost a large quantity of blood from piles. I tied four large piles, under chloroform, transfixing them with a curved needle and tying them, cutting them off afterwards.

Sho had completely recovered in ten days, and then I removed an external pile, and she went out cured after three days.

Case lxxvii. E. B., aged about 50, had for many years suffered from hemorrhoids and prolapsus ani; so that the bowel came down outside the sphincter as he was walking, and blood flowed freely at those times; in addition to this and the constant irritation he was suffering, the skin around the anus was so loose, that it was occasionally dragged forcibly inside the aperture by the levator ani, and was there so squeezed that considerable pain was produced. His general health was much impaired by this permanent source of irritation and by hemorrhage.

At the first operation I tied a large and hard excrescence projecting on the right side of the anus from the mucous membrane of the rectum, by means of strong thread and a large curved needle, and a smaller one I cut off with a pair of scissors.

From this operation he soon recovered, and after four weeks I operated on him again, under chloroform, and removed two large oblong flaps of integument from the side of the anus, and tied one internal pile.

The recovery after this proceeding was not very rapid, but it was complete, and he got rid of all the troublesome symptoms and became a much stronger man.

Case lxxviii. M. V., aged about 30, was suffering from internal hemorrhoids, and a great relaxation of the skin about the anus.

I tied, by means of a curved needle and strong thread, a large bright red shining tumour, which projected from the anus, and after passing a needle through a flap of the external skin, I cut it off and tied it up; this I repeated upon the opposite side, and the patient soon recovered without any bad symptoms.

A disagreeable adjunct to this case was, that as I was proceeding to operate, a quantity of ascarides made their escape from their place of concealment.

Case lxxix. M. S., aged 25. In this case I tied three large piles by means of a tenaculum and a strong ligature. She complained of great pain, and there was some bleeding. The ligatures came away in ten days, but the bleeding had not quite ceased when she left the Infirmary, and I did not see her afterwards.

Case lxxx. A. B., aged about 50, had suffered for many

years from hemorrhage, so that he became quite anæmic. I tied one large and prominent pile, from which blood was frequently ejected as much as two or three feet, and to the neighbouring unhealthy mucous surface I applied nitric acid.

When he recovered from this operation, there was still considerable hemorrhage; and I tied two large and prominent piles by transfixing them with two tenacula, introduced separately at right angles with one another.

This proceeding appeared to be effectual, and for some months afterwards there was no bleeding. I heard afterwards that there had been a return of the symptoms.

Case lxxxi. D. P., had lost so much blood from bleeding piles, that he had become anæmic, and was obliged to give up his work.

With the two tenacula, I tied two round and prominent piles, and he was cured, having very rapidly regained his strength.

Case lxxxii. J. O., aged 50 years, was also obliged to give up his employment in consequence of loss of blood. I tied, in this case, four large and vascular tumours, cutting off the tops of them before the ligatures were finally tied. He recovered speedily.

Case lxxxiii. A. B. A single prominent pile was tied in this case to stop the bleeding, and he was cured at once.

Remarks. I have no record of the cases of external hemorrhoids which I have treated by removal with the scissors; generally after the application of a conical mass of pounded ice and salt wrapped in oil-silk, for about five or ten minutes, by which they can be frozen until they are quite white, and removed without any pain. Neither have I kept any account of several cases of prolapsus ani and hemorrhoids, with loss of blood, in which I used nitric acid with the good success that usually follows the employment of this escharotic in these complaints. I may take this opportunity of reminding my readers that this plan was first brought prominently before the profession by Dr. Houston, of Dublin, and that since his papers on the subject, in the year 1843, it has been an established and well known method of treatment, where ligature has not been thought necessary, and it is now rather late in the day (or perhaps too early) for any surgeon to try to bring it forward as his own, or a new mode. There are few cases where the in-

fluence of surgical treatment in restoring the health is more marked than in these cases of bleeding piles; and of this fact, those which I have narrated will serve as a sample.

Fissure of the Anus. CASE LXXXIV. E. M., aged 35, with fissure of the anus, which had existed for some time. I divided the sphincter when the patient was under the influence of chloroform, and she soon mended; but afterwards the peculiar pain of the fissure returned.

REMARKS. This is the only instance which I have recorded of an operation for fissure of the anus, and the result was not thoroughly satisfactory. For some years past I have treated similar cases with the nitrate of mercury ointment, touching them every other day with the nitrate of silver, and with success in every instance.

It is worthy of note, that the effect of the nitrate of silver and nitrate of mercury is much the same as that of nitric acid, except that the latter acts more powerfully as an escharotic, and is much more painful. The cases of fissure of the anus are not very numerous among the poor.

III.

OPERATIONS ON THE BREAST.

The third subdivision will contain the operations upon the breast, all of which were on female subjects; and they are not very numerous. The diseases treated in this way were, hydatid tumour, cystosarcoma, the chronic mammary tumour, and carcinoma.

Hydatid Tumour. Case lxxxv. T. C., aged 22, had discovered a tumour as large as an apple just above the right breast, rather to the outer side, towards the edge of the axilla. She reported that it arose from a strain of the arm. It was extremely hard, and I considered it to be one of the chronic mammary tumours seen in young women; and it had been a year growing to the size above named. She agreed to its removal by operation, which was done without chloroform, by a vertical incision about three inches long, exposing the surface of the tumour. The next incision accidentally punctured the swelling and a jet of pus started out a considerable distance. Thinking that I had mistaken a chronic abscess for a tumour, I laid it open, when a round semitransparent hydatid slipped out, like a large white grape. I dissected out the sac with some little difficulty, on account of its adhesion to tho pectoral muscle. There was no hemorrhage and the wound healed almost completely by the first intention; and there was no suppuration. She has remained well.

This case had one point of practical interest. Had I suspected the presence of pus and found my suspicions confirmed by tho grooved needle, I should probably have treated the disease as an abscess, and have punctured, but not cured it; for the destruction of the dense cyst through a small aperture would most likely have been a troublesome work of weeks or months, instead of the three or four days which the cure actually required. Here, therefore, the grooved needle would have been a false guide.

Cystosarcoma. Case lxxxvi. H. R., aged 40, married, had one child when twenty years of age, and had suffered from a swelling in the left breast for six months before I saw her, when it was painful, and of the size of an apple, connected with the mammary gland.

I removed the tumour without any skin, opening two cysts casually during the operation. Four vessels required ligature, and three sutures were used.

She suffered for many days from the vomiting produced by chloroform, and suppuration occurred in the wound. It ultimately healed entirely, and she went out complaining of pain in the scar.

The tumour was a genuine cystoma, with various cysts and fibrous matter, very dense and firm.

Case lxxxvii. S. M., aged 22, had been the subject of a painless tumour in the left breast for some years; but, having been confined a few months before I saw her, it had become enlarged, painful and soft in parts, discharging some pus. I opened it freely under chloroform, with the hope that it would gradually shrink, but without any good result; and I subsequently removed it by operation, which was unusually troublesome, in consequence of the previous inflammation and incisions, and because of the adhesion of the skin. Six ligatures and four sutures were used. She recovered well after the operation; but the healing was rather slow.

The tumour was hard, white, and fibrous, with suppurating cavities; and, when examined under the microcope, it showed fat and oil-globules; and in the softened parts of it were round and oval and partly opaque masses of granular cells, looking something like pigment-cells, except that the colour was not so dark. They were entirely soluble in caustic alkali, and probably presented the granular appearance from the presence of minute oil-globules.

I shall have to notice a similar structure in other tumours; and this has been described by some authors as being the fluid found in cystic diseases.

Chronic Mammary Tumour. Case lxxxviii. M. A. B., aged 22, had a small, hard, and very sensitive tumour in the left breast for three years, and had been subject to various treatment to induce absorption before she came under my care; and

the swelling had ultimately become adherent to the skin and the nipple. I removed it, using pins and twisted suture in bringing the parts together, and a compress and bandage. A slight attack of erysipelas came on about the fourth day, followed by acute inflammation of the opposite breast, threatening suppuration. This was checked by leeches, and she went out cured.

The tumour was as large as a chestnut, hard and solid, and surrounded with a thin cellular cyst. Upon section with a scalpel, it caused a grating sound, described by some writers as peculiar to scirrhus. The microscopic examination showed a large quantity of the fibrous element in its substance, and a number of small cells, some with nuclei, but many without, free, and entangled in the fibre. In addition to this was fat, and a considerable number of minute oil-globules.

These microscopic appearances are, according to my experience, constant to the chronic mammary tumour, such as I have described in this case; and it will not be necessary to repeat them in my other cases of the same disease.

Case lxxxix. A. D., aged 22, had the tumour in the right breast two years. Her health was good. She had been delivered of a child four years before. The tumour was hard, as large as a chestnut, and not sensitive; and it gave rise to no symptoms, but was gradually increasing in size.

The disease was easily removed, although a part of the mammary gland was divided. She took but one drachm of chloroform. One ligature only was necessary. Some induration remained about the wound for a week or two after it had healed; but it afterwards disappeared entirely, and she went home cured.

Case xc. E. W., aged 30, with a small hard round tumour of the left breast, connected with the upper edge of the mammary gland. The operation of removal was easily performed, and the parts brought together with pins, which were removed on the fourth day; and the wound healed rapidly.

Case xci. A. P., aged 19, with a rounded but lobulated tumour at the upper part of the left mammary region. It was readily removed, and the wound brought together by two pins and adhesive. She was cured in ten days.

Carcinoma. CASE XCII. M. V., agod 40, admitted into tho medical wards on account of rheumatism, was transferred to my caro in consequence of the existence of a mammary tumour, which had been growing for four years, until it had reached tho sizo of an orange. The skin had become adherent to its surface, and thero was a large and hard gland in the axilla.

Chloroform was administered, but sho became so faint and collapsed, that she appeared dying; aud tho operation was postponed uutil a future day, when I performed it without chloroform, removing the tumour with the adherent skin, and drawiug out two hard glands from the axilla. Five sutures were required to keep the sides of this large gap together, and they were supported by compress and bandage. She went away well in about six weeks; and I saw her once or twice afterwards, and ordered her some cod-liver oil, to try and improve her general health, and she became extremely florid and fat.

About six weeks after I last saw her, she died of apoplexy; and the *post mortem* examination revealed caucer of the cerebrum and cerebellum, and lungs and liver. The disease was composed of well marked cancer-cells, with nuclei aud nucleoli. In the tumour itself, the cells were caudate, round, and fusiform; whilst in the glands they were simply round.

CASE XCIII. E. S., aged 67, underwent excision of the right breast three years before I saw her; and she consulted me in consequence of the return of the disease iu the form of a small, hard, and painful tumour under the scar of the old operation, with a small hard gland in the axilla. I removed the tumour, with a portion of the skin above it, without chloroform; and after a little suppuration the wound healed, aud she went home to the couutry. I believe that the disease soon returned in the scar, but the ultimate result I did not hear.

The microscope disclosed excellent specimens of cancer-cells, with nuclei and nucleoli. Some of the cells were round, but most of them were pyriform or caudate, which appears to me to be the most common form, at any rate, in these tumours.

CASE XCIV. E. W., aged 44, with a tumour of the right breast of ten years growth. It had latterly increased more rapidly, and was about to ulcerate above the nipple, where it was adherent to the skin. The swelling was of the size of her fist. Her general health was good, aud sho was stout and well.

I removed the tumour and adherent skin freely down to the

pectoral muscle. Eight ligatures and four sutures were used, and a bandage and compress applied, the arm being bound down to the side. She required opium tolerably freely after the operation, but recovered fairly, so that she was made an out-patient in less than three weeks. A little suppuration ensued at the outer part of the wound, with some suspicious induration, which disappeared after a few weeks.

Three months after the operation the wound was perfectly sound; but there was swelling, with induration of the cervical glands, just above the clavicle.

The microscopic examination showed excellent specimens of cancer-cells; that is, cells of varied form, round, oval, caudate, and fusiform, with well marked nuclei and nucleoli.

Case xcv. A. S., aged 50, with a small circumscribed tumour of the breast of eighteen months standing; it was situated about two inches above the nipple and was immovable, that is, adherent to the fascia covering the pectoral muscle. The nipple was retracted and sore, with a little discharge from it.

By an oblique incision downwards and outwards I removed the nipple and the tumour and the fascia upon which it rested, dissecting the muscle clean. Three vessels were tied; and sutures, compress and bandage were applied. She went away cured in three weeks, the wound being healed and her health being good. The cancer-cells were peculiarly large, and the nuclei and nucleoli very numerous and distinct, and mixed with fat and oil-globules. The disease returned within two years.

Case xcvi. E. J., aged 55, with a hard tumour of the right breast, with two or three nodules extending to the axilla. I removed the breast with the hard axillary glands; but found considerable difficulty in extracting the latter. Four vessels were tied and the parts brought together in my usual method. The only troublesome symptom was the sickness from the chloroform. I gave her opium and plenty of stimulus, and she did very well. The wound was healed in eighteen days. The microscopic examination confirmed the opinion that the disease was cancerous.

Many years have elapsed since this patient was operated on, but I have not heard of her.

Case xcvii. A. G., aged 68, with a hard and heavy scirrhous mass hanging on the left breast. I removed the whole of it with the loose skin in which it was suspended. It was brought together by six sutures, adhesive, compress, and bandage. The wound was a long time healing, but little union by the first intention having taken place. The tumour was extremely hard, and from some parts of it, when divided, black matter flowed. The microscopic examination showed large distinct pyriform, round, and triangular nucleated cells. The disease returned.

Case xcviii. E. G., aged 39, with a hard tumour in the left breast. She had borne a family; but, owing to some peculiarity in the nipple, had never been able to suckle her children upon this side. The nipple was retracted, and skin adherent. I removed the whole breast, with the tumour, skin, and nipple, leaving a large deep gap, which bled very freely and required several vessels. The wound was brought together by pins, adhesive, compress, and bandage; and it had healed in a little less than a month. The patient went out quite well.

I have no record of the microscopic appearances in this case; and I never heard of her again, although some years have now elapsed since the operation.

Case xcix. M. B., aged 56, with a large hard tumour of the left breast, of only three months growth. The skin was adherent and the nipple completely drawn in. I removed the whole breast with the tumour, tied four vessels, and used four sutures, adhesive, compress, and bandage. On the fourth day she had a slight attack of erysipelas, requiring the removal of dressings and sutures, the application of the "Pigmentum Iodinii" (which we use of the strength of two scruples to one ounce of the spirit), and the internal use of the tincture of the sesquichloride of iron. The eruption soon subsided, and the wound healed; and she was dismissed cured.

The tumour was accidentally kept some days before I had an opportunity of examining it. The cells of which it was chiefly composed were very irregular in form, small, and nucleated. I never heard of this patient again.

Case c. J. T., aged 43, whose mother died of cancer of the breast, consulted me on account of a small, hard, and very sensitive tumour in the upper part of the left breast; and I re-

commended its removal. The patient was weak and in an extremely nervons coudition, and I operated without chloroform. The incision was three inches long, and I divided the upper part of the mammary gland. She became very faint. There were some black spots in the tumour, of a melanotic kind. One vessel only was tied and two sutures used. The wound healed almost completely by the first intention, except the lower part, which remained open for some time; and it was nearly a month before she was quite well. Within another month, a small indurated mass had appeared at the side of the breast.

The microscopic examination of the tumour which I had removed was distinctly cancerous, large rouuded cells, with very well marked nuclei.

There was somethiug so extraordiuary in the history of this patient, that onr interviews were occasionally of the most comical description, although cancer truly is anything but an entertaining or jocose snbject; and, although not connected with this particular operation, I will mention one or two facts, as a curious instance of deception.

She professed that she never ate anything besides a grape or two, or a minute fragment of biscuit, although I afterwards had good reason to believe that she did very well iu that way; and she took opinm largely, but of course denied it. She had become a Roman Catholic some time before the operation, for that was rather the fashion here at that date; and, with the greatest adroitness, she nsed to keep the Roman Catholic priests (aud even the bishop too), as well as the evangelical clergymen of Clifton, waiting upon her. She would horrify the latter with some accouuts of the cruel penances she had to undergo, how she had to kneel on a hard stone for so many honrs, or until she was borne away fainting; and she would entertain the former with fictitious remarks of a contemptuous and abusive kind, said to emanate from the English ecclesiastics. I sometimes encountered one set of divines, and sometimes the other, iu her room, trying to convince her vacillating mind; and she all the time was enjoying her opium, and laughing at both.

I believe that she submitted to the operation of excision of the breast (aud it was done without chloroform) in order to

raise a stock of sympathy among her friends, and to derive the solid advantages that usually accompany these kind feelings, and which a clever person like my patient knew well how to extract. Another motive was to keep her creditors at a respectful distance; for all the furniture that she was using had been obtained by false representations; and during my attendance, on one occasion she had the doors barricaded, and a man on guard to keep out the wrathful creditors who had been duped, and I had to find my way in by a very circuitous route; while, on another occasion, the house had been invaded and most of the things carried off. Some months after I had ceased to attend her, she was tried for swindling, and condemned to a year's imprisonment, which I believe she underwent; and I have lately been given to understand that she is well, and is carrying on her avocations in a neighbouring town.

CASE CI. H. H., aged 64, with a large tumour in the left breast. It was very hard, and was increasing. I removed it very freely, and there was unusually free hemorrhage, two of the vessels which had been divided being very large; and when all the bleeding had been stayed, there was an enormous gap in her side, which was brought fairly together by sutures and bandage.

The patient was a very large and fat woman, with a very feeble pulse; and I therefore gave her but half a drachm of chloroform altogether, but it seemed to act satisfactorily. She was very low and weak for a few days after the operation, but revived with the aid of stimulus. She had a slight attack of erysipelas in the face; but the wound was unaffected and healed chiefly by the first intention. The patient suffered for a time from a slough in the back, which, however, also healed readily; and she went out cured. I have not heard of her since.

CASE CII. E. H., aged 36, had a tumour of the left breast for two years before I saw her; it was very hard, and attached to the upper and inner edge of the gland. I removed all the tumour, with some skin and the surrounding tissues; and after tying several vessels which bled freely I brought the wound together with three pins. She went on perfectly well. The parts were kept in contact and healed by the first intention, except the lower part, from which some bloody matter oozed for a few days.

The microscopic examination showed well marked cancer-cells.

A month or two after the operation, a small hard tubercle appeared upon the skin at the points of entrance and exit of each pin, making six small and hard projections, in two regular rows of three each. The patient recovered her health and strength; and after a time the induration entirely disappeared, and she has remained quite free from disease up to the present date.

Case ciii. E. O., aged 36, a spare woman, with a considerable tumour in the left breast. It had been growing for a great length of time, and her health had suffered considerably. At the operation, it was necessary to remove a large quantity of skin; and the disease extended high into the axilla, so that there was some difficulty in removing it entirely; but it was accomplished satisfactorily at last, although she lost a considerable quantity of blood. A large number of ligatures were required, and three sutures.

Her recovery was satisfactory. Very little union by the first intention took place; but the parts were kept in good position, and ultimately healed well. One ligature was so firmly attached that I could not get it away, having tried elastic pressure, traction, and other means to loosen it. It was cut off short, and remained attached when she went home, all the rest of the wound being soundly and firmly healed.

The tumour showed, under the microscope, granular blood-corpuscles and large nucleated cells, many of them having dark contents, of a granular appearance, which were probably minute particles of oil or fat. A section of the tumour had the ordinary aspect of a scirrhous growth.

She has remained well up to the present date, and there has been no return of the disease. The ligature came away after some weeks.

Case civ. M. S., aged 45, with a hard nodulated tumour of the left breast, not adherent to the subjacent parts, and without any glandular complication. I removed the disease without the skin. Three vessels were tied, and three sutures used. I removed the dressings and sutures on the fourth day, and found it nearly healed; and she soon recovered.

The microscopic examination showed cells of various sizes,

nucleated, many of them containing granules of pigment, almost black. The history of the tumour and its appearance on section were clearly those of cancer.

At the present time, when these cases are being prepared for publication, this patient is well, and there has been no return of the disease, now two years and a half after the operation.

CASE CV. H. T., aged 50, with a small hard tumour of the left breast, which I removed with the skin and the nipple, including two or three separate nodules which were near, but leaving an enlarged and hard axillary gland. The bleeding was very free; and six ligatures were required, and three sutures, with bandage. She required stimulus tolerably freely afterwards, but went on well without any unfavourable symptoms; and when she went out the wound was quite healed and her general health much improved.

The only remaining case is one in which no operation was performed; but, as it occurred at the period when the caustics were so much used, I thought it a favourable instance in which to try that plan and it is but fair to record it.

CASE CVI. A. B., aged 60, with a distinct, very hard tumour in the breast. I applied the chloride of zinc, after dissecting off a patch of skin while the patient was under chloroform. This was repeated several times, and a deep slough was formed, and it turned out in a mass, leaving for a time a tolerably healthy surface; and a partial closure of the wound took place, but, before it had healed, the disease returned. I applied caustic several times; but the ultimate result was most unsatisfactory, the patient having gone home in a very weak state of health, with a large carcinomatous ulceration in the place of the tumour that had existed before, aud I have little doubt that she speedily died.

REMARKS. Of this series of twenty-two cases, one was hydatid disease, two were cases of cysto-sarcoma, four of the chronic mammary tumour, and fifteen of carcinoma; and this is probably about the usual proportion in which disease attacks the female breast. The immediate result of the operations was satisfactory in every instance. All the wounds healed well, and the seven first cases were cured entirely; but, although they all recovered, I do not conclude from this amount of success that

the operation of removal of the breast is devoid of all danger; but, compared to the gravity of other questions connected with these cases, I do not think much stress can be laid upon it.

The subject of cancer of the breast is a sad one, and the amount of permanent success is generally very discouraging; but in looking over my cases, few as they are, the results are of such a nature that I should be disposed to recommend the operation in very many instances. I do not remember the number of patients applying to me with disease of the breast in whom no operation was deemed advisable; but this is a matter of less importance, for here again I cannot see how any practical aid can be obtained for any special case from numerical considerations.

Of the fourteen cases of cancer operated on, all healed well, and for a time each patient was better than she had been before. One died very speedily of apoplexy; but whether or no the internal cancer progressed more rapidly on account of removal of the external disease, I am unable to say. In five, I know that it returned within two years; and of these, four are dead, and one still survives. I also know that three, at least, are cured, the latest having been operated on two years and a half ago; and of four others I have no further report, for I never heard of them after they left my care. The youngest operated on was thirty-six, and the eldest sixty-eight; and the average of all was forty-nine. In nearly three-fourths of the cases the disease was on the left side. The presence of hard axillary glands did not much influence the mode of treatment; for in no case where they had existed before the operation, did they give any trouble afterwards. Whether they prove that the constitution is affected with the disease, I cannot tell. Of those which were operated on with enlarged axillary glands, two died, whilst of two others I have had no recent account, but they were well when last heard of.

The question of operation in cancerous growths is of so great importance that all records are of value, and I therefore add a tabular notice of these cases.

No. of Case.	Age.	Duration of disease before operation.	Axillary glands affected.	Remarks.
92	40	4 years.	Yes.	Died about three months afterwards of apoplexy, with cancer of brain. Scar sound.
93	67	Breast excised 3 yrs. before.	Yes.	After the removal of a cancerous cicatrix the disease returned, and she died.
94	44	10 years.	No.	The disease returned in the cervical glands, and destroyed her life.
95	50	18 months.	No.	Disease returned in two years, and proved fatal.
96	55	Not recorded.	Yes.	No account of this patient since she went home with the wound healed.
97	68	Not recorded.	No.	The disease returned, and the patient died.
98	39	Not recorded.	No.	I received no record of this patient after she went away cured.
99	56	3 months.	No.	No further record. She went away cured.
100	43	Not recorded.	No.	The disease returned in spots about the chest, but she is still living. The operation was performed in June 1854.
101	64	Not recorded.	No.	No further record of the case. She went away cured.
102	36	2 years.	No.	Cured. Alive now and well. Operation performed June 1856.
103	36	Several years.	No.	The tumour extended high into the axilla. The patient is alive and well now. Operation performed November 1857.
104	45	Not recorded.	No.	Alive and well now. No return of the disease. Operation, December 1857.
105	50	Not recorded.	Yes.	No further account of her. Operation performed August 1859.

In dressing the wound after the operation, I am very careful to tie all the vessels, and to bring the parts into absolute con-

tact with as many pins as may be necessary, with thin strips of adhesive in each interval; a narrow piece of simple dressing along the wound, and the bandage firmly applied over all. By these means the parts are kept in absolute contact and repose for the first twenty-four hours, and a considerable amount of union by the first intention is obtained; and even if the cavity does not become obliterated at once, by keeping the pins *in situ*, and letting the fluid contents ooze out of the lower part of the incision, an open sore is prevented. I always see my operation cases once or twice within the first twenty-four hours; and, if necessary, cut through the bandages, whenever they are tight or oppressive.

It is important to bear in mind a practical lesson taught by some of these cases and other similar ones; namely, that after the removal of a cancerous tumour, the scar is frequently very hard for a considerable time; and that the induration gradually melts away in most instances, being due to simple thickening, and not to any specific deposit.

At the Bristol Royal Infirmary, in the after treatment of these cases, and, indeed, of all cases where severe operations have been performed, as amputation, excision, or the removal of large tumours, particularly if they have been accompanied with the loss of blood, we have been for a long time in the habit of giving our patients, as soon as possible, good diet, with meat and a little stimulus, and opium when requisite; and sometimes it has appeared necessary to give stimulants very freely; and the system is, doubtless, in this way more quickly lifted out of the depressed state in which tho shock of a severe cutting operation has placed it, and the recoveries are more satisfactory; and I may add, that the plan of giving support freely in these cases was the custom here long before the date of that famous letter which appeared some years ago, in large type, in the *Times* newspaper, in which a member of the Council of the Royal College of Surgeons addressed the editor, and told him how he treated the patients under his care, particularly his operation cases, with wine and good things; and how his success was much better than that of his neighbours, who did not advance with the times, but stuck to the old routine. This bold letter, with the help of the large circulation of the *Times*, undoubtedly answered the purpose of a productive advertisement, as it deserved, for it was on a larger scale and more cleverly done

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than the paragraphs alluding to Moses' clothes-mart and Rowland's kalydor; but if the writer had been practising in the provinces, or if he had been a man of smaller note in the metropolis, and not connected with a large hospital and the Royal College, I think he would promptly have been called to account for his epistle.

IV.

OPERATIONS ON THE GENITO-URINARY APPARATUS.

The fourth division comprises the surgical operations performed upon the genito-urinary organs. They are numerous and important, and I have arranged them into the following five subdivisions :— operations upon the urethra, including urethral calculi, extraneous substances, the relief of retention, and cases of extravasation of urine; circumcision and amputation of the penis ; operations for hydrocele, hematocele, and castration ; cases of enlarged clitoris, epithelioma of vagina, obliterated vagina, and vascular tumours of the meatus; and lastly, lithotomy and lithotrity in male and female.

Urethral Operations. Case cvii. H. W., a weakly boy, aged 17, had suffered for many years from symptoms of stone. He was obliged to press his fingers against the scrotum as he was making water, in which he experienced considerable difficulty. A stone was lodged in the urethra in front of the bulb at the posterior edge of the scrotum. I made a short longitudinal cut into the urethra down upon the stone, which flew out upon pressure. It was about as large as an olive, and of a well marked spindle shape, smooth, and of a pale colour. I then sounded him, but found no stone in the bladder; and therefore left a gum elastic catheter in the urethra, and brought the wound together with a pin. The union went on but slowly, but he had no bad symptoms which could be referred to this operation; at the same time, the boy grew thin, his pulse was rapid, and he had a considerable cough. As his surgical ailment was almost well, I transferred him to the medical wards, under the care of one of the physicians. His cough grew worse, and suppuration came on among the muscles of the thigh; and he died of phthisis three months after the operation.

The calculus was lithic acid outside and oxalate of lime internally.

Case cviii. G. B., aged 5, with difficulty of passing water. I found a stone impacted in his urethra just behind the scrotum, and tried to remove it by various instruments, but in vain. I therefore made a section down upon it, and removed a rough and irregularly rounded oxalate of lime stone. A good deal of disturbance of his system followed, and an abscess formed on the dorsum of the penis, which required to be opened, and then he soon recovered.

Case cix. J. A., aged 30, the subject of stricture of the urethra of ten years standing, was in the habit of passing a piece of gutta percha into the urethra, and walking about without taking any precaution to prevent its slipping in; and this happened on the morning of the third day before I saw him; and he felt but little trouble from its presence. The anterior extremity of the bougie could be felt at the margin of the scrotum, but could not be withdrawn.

After trying in vain various methods to extract it, I cut down upon the foreign substance and withdrew it; and passing a director through the stricture forwards slit it up, with some little difficulty, on account of its great hardness. A full sized catheter was then passed into the bladder, and retained. After some little suppuration, which seemed to interfere with the healing of tho wound, it gradually closed, until a fistula remained. This was pared and brought together by a pin, and ultimately healed. It was necessary to pass a catheter daily during the latter part of the treatment: but after the fistulous opening had entirely healed, the stricture lost its tendency to close. He was quite well three years after the operation.

Retention and Extravasation of Urine. Case cx. R. J., aged 64, who had been afflicted with severe stricture for many years, was admitted under my care suffering from partial retention, for he only made water by drops. During his stay in tho Infirmary, an abscess formed in the perineum, which I punctured, and it healed up, there being no direct communication between its cavity and the urethra. After the lapse of six weeks, he became much worse, and absolute retention came on. At no timo had I been able to pass a catheter beyond the bulb. The urgency of the symptoms increasing, I operated; and

cutting into the middle line of the perineum, succeeded at once in opening the urethra beyond the stricture and passing a gum elastic catheter into the bladder, and the urine flowed out readily. The instrument was retained in his bladder, and I hoped that he was placed in a position to recover; but instead of this he grew weaker, and about eight days after the operation vomiting and shivering occurred. These symptoms were relieved by brandy and a few large doses of quinine, and he improved, the water flowing readily from the wound. A fortnight after the operation, hemorrhage from the bladder took place, and he died on the nineteenth day.

Post Mortem Examination. A female catheter passed readily through the wound iuto the bladder. The stricture allowed the passage of a director; the prostate was healthy; but the muscular coat of the bladder was much hypertrophied, and there were six ounces of coagula in it. There was fatty degeneration of both kidneys, and abscess in the right one, but little of the healthy structure remained, and numerous cysts were found in and upon them. The rest of the orgaus were healthy, and there was no urea iu the blood.

The kidneys in this case were too diseased to enable the patient to recover his health; and it is uot impossible that the more rapid flow of uriue which occurred from the time of the operation interfered with their action, and with any attempt at repair they made. Tho fact that patients, who have suffered for a long timo from retentiou aud in whom the urine has for any reason begun all at once to flow freely, will die abruptly without any very obvious cause in the course of a few weeks, has been observed by Sir B. Brodie, but not by many other writers.

Case cxi. J. H., aged 68, an old soldier, with a loug standing stricture. He had been a patient at the Bristol Royal Infirmary for twenty-three years at various times, and most of tho surgeons had tried on different emergencies to relieve him. No instrument had entered his bladder for eight years before he happened to come under my care; on which occasion he had retention, and some of his urine dribbled away; there was also a collection of pus in the canal about the position of the bulb, for upon pressure he could get rid of it. As uo instrument would pass tho stricturo, I cut into his perineum on the raphe, and after dividing freely some very hard cartilaginous

tissue, I opened the membranous portion of the urethra, and passed a female catheter into the bladder. I then thrust a male catheter through the stricture into the wound, and guided it thence into the bladder, where it was made fast and retained. I gave him some opium and brandy and he soon revived, passing water freely through the catheter. The appetite was good. I kept this instrument in the bladder until the sixth day, when it was withdrawn and another introduced. On the ninth day, all the water passed through the urethra, and a full sized catheter could be readily introduced. As he was an experienced patient, he was directed to do it himself occasionally; and after a few days he went out, much improved in health, and able to make water more easily than he had done for five-and-twenty years. I met the old man after this operation very frequently; and received satisfactory accounts of him long after he left my care.

The only points in this case which I wish to draw particular attention to, are the difficulty of the operation and its very great success, and the contrast it offers to the last described case, where an operation, apparently equally successful, did not keep the patient from sinking from the effects of the stricture and retention.

Case cxii. J.B., aged about 40, was admitted as my patient, suffering from extravasation of urine. He had passed water *guttatim* for six weeks; and four days before admission the scrotum began to swell; and, upon the day of his admission, whilst he was straining to make water, the penis suddenly became infiltrated, and attained an enormous size. I passed a catheter into a cavity in front of the bulb, and drew off some pus, urine, and blood; and afterwards, I succeeded in passing one into the bladder, whence I drew some clear urine. This instrument was retained, and I cut freely into the perineum, penis, and made four deep and long cuts into the scrotum. By the fourth day the water had leaked out of the penis, but the swelling of the scrotum remained. He was very low and weak, and I gave him some wine. A large slough formed in the perineum and lower part of the scrotum, which came away. The catheter was withdrawn, black and encrusted with phosphates, and another occasionally passed without much difficulty. All the urine passed through the hole in the perineum until the twenty-first day, when he reported that some came

the right way. In a month more the large wounds had healed, and he passed urine freely in a stream entirely through the urethra, and much better than he had done for the previous twelve years.

Case cxiii. J. C., aged 41, was admitted with extravasation of urine of four days standing, the stricture which caused it having existed for twenty years, having been, according to his report, the result of an accident. The scrotum was swollen as large as a child's head, and a tumour pointed in the perineum, shewing the position of a large slough there. I cut deeply into the perineum, and very fetid pus and urine flowed out; and I also incised the scrotum on each side. The urine soon came in all directions, and flowed freely. A vast slough separated from the scrotum, perineum, and the side of the anus; but, notwithstanding this loss of substance, after careful watching for thirty-three days, he went out cured. His diet was good, and I allowed him some strong beer, and simply some tragacanth mixture with potash to relieve the irritation of the urine upon the wound. When he left the Infirmary, he could pass water in a better stream than he had done for many years.

Case cxiv. A. B., admitted with extravasation of urine, in consequence of retention following a long standing stricture. After cutting into the scrotum and perineum, I managed to introduce a catheter into his bladder. There was a very free discharge of fetid pus from his perineum. With the aid of good diet, he soon improved; and when he went out, his wounds were nearly healed and he could make water easily.

Case cxv. H. B., aged 40, had a gradually and slowly progressing swelling of the scrotum for nearly a fortnight; and when he was admitted as my patient, the disease had in a considerable degree run its course; and there was sloughing of the scrotum and cellular membrane of the perineum, with a discharge of pus and urine. A further opening was made, and all went on well. He was discharged cured in about a month, able to pass water very freely; and I saw him several years after this occurrence, and he was still quite well.

Case cxvi. E. B., aged 30, was admitted under my care with extravasation of urine; the penis, scrotum, perineum, and pubis, being much swollen and very painful.

I tried under chloroform to pass an instrument into his

bladder, but it entered a perineal abscess. I therefore opened his perineum, freely letting out a large quantity of fluid pus, blood, and urine; made two deep cuts into the scrotum, and made also two incisions above the pubis; and, whilst doing this, a little to the left of the middle line of the body there was a sudden large jet of bright arterial blood, apparently from a vessel as large as the radial artery, although I had not cut into the muscles. It was tied at once; and, when my finger was upon it, it pulsated very strongly; and I can only imagine it to have been the epigastric artery running very superficially.

This patient felt much relieved as soon as he recovered from the chloroform, and he went on well afterwards, the urine flowing first from the wound in the perineum, also from the scrotum, and for a short time it came away in a full stream from the aperture I had made above the pubis. He went out with the wounds healed seven weeks after the operation of cutting into the perineum, and has been able to pass urine much more freely since.

Case cxvii. S. J., aged 34, was subject to stricture of the urethra; and one night, his son, a boy, sleeping in the same bed as his father, but with his head towards the bottom, accidentally gave him a kick in the perineum. He suffered much from this little accident; and on the fourth day, the swelling of the penis and scrotum commenced; and for this he was treated by a surgeon of this town by purgatives and leeches to the scrotum, under the idea that he had inflammatory swelling of the parts. I did not see him until the eighth day, and then he was very pale and collapsed, and almost pulseless. He had well marked urinary infiltration in the penis, scrotum, perineum, and pubis, and a dulness in the lower part of the abdomen, showing that water was still retained in the bladder. I tried to pass a catheter, but failed; I then cut through by consecutive cuts with Stafford's instrument a long stricture in the spongy portion of the urethra, thrusting on the instrument as far as I could at each cut; but not being quite certain of the direction of the parts, in consequence of the swelling of the penis and scrotum, I had him held up, and cut into his scrotum and perineum; and in the latter region I tried to hit upon the urethra, but having no guide, I did not succeed. I therefore tried again to introduce an instrument through the

urethra, and, by exercise of some little force, succeeded in getting in No. 4, and leaving it there, after drawing off the water. He was excessively weak and collapsed for some days, and then he had symptoms of peritonitis, shewing themselves by constipation, difficulty and disinclination in making water, with great distension and abdominal tenderness. This condition resisted a dose of castor oil; and I therefore ordered him a little blue pill and opium, with the best effect; for by its aid his bad symptoms subsided. I did not cut into the penis or above the pubis, and the result was that a slough formed in each place. A large part of his scrotum also sloughed, and came away. He required a considerable quantity of stimulus.

This patient went through weeks of excessive illness and peril, profuse diarrhœa, loss of appetite, and rigors. He ultimately recovered completely, and went to work.

In the four following cases, extravasation of urine was fatal.

Case cxviii. J. C., admitted with partial retention, from an old standing stricture. I could not pass a catheter into the bladder; but, after repeated attempts, he managed to make water. I gave him some opium to ease his pain, and ordered him a warm bath. His scrotum was red when he was admitted. The next day he told me that he had passed water, but he became much worse, and it was evident that he had extravasation of urine. I cut into his perineum, and tried to introduce a catheter, but it passed into a slough below, and the point could be turned out through the wound. I made four incisions into the red and swollen scrotum. The next day he had diarrhœa; but the urine flowed freely through the wound, and he seemed otherwise better. He had some wine daily, but he gradually got into a typhoid condition and died on the eleventh day from the operation.

Post Mortem Examination. We found sloughing and suppuration of the cellular tissue of the perineum, but none in the pelvis. He had abscess of the prostate, great thickening of the muscular coat of the bladder, dilatation of both ureters, suppuration in the substance and pelves of both kidneys, and obliteration of all the secretory structure of the right.

This patient was too much damaged by the evil effects of the long standing stricture upon his urinary system, to allow of any repair.

Case cxix. E. E., aged 40, with extravasation of urine from old stricture and retention. When he was admitted, he had great pain and redness on the left side of the scrotum and perineum, and the urine dribbled away. I operated on the evening of his admission, and succeeded in passing a catheter. I then cut into the perineum and opened an abscess, from which pus and urine flowed; and I made three cuts into the scrotum, to let out the serum and urine, and gave him some wine. Diarrhœa followed in this case also, and he became much weaker; and died on the tenth day with signs of pyæmia.

Post Mortem Examination. I found his bladder tolerably healthy. There was pus in the left tunica vaginalis, suppuration above the pubis, a large abscess above the right shoulder, with sloughing of the cellular tissue, a rough state of the clavicle, abscess above each elbow, and suppuration of the lungs and kidneys.

It is said that pyæmia is more likely to follow operations about the perineum and neck of the bladder than any other region of the body, and this was a well marked instance of that state, with the numerous secondary abscesses. It has not been the result of my experience to find pyæmia more frequent in these cases; at the same time, the existence of a mass of large veins round the neck of the bladder, surrounded with hard fibrous tissues, is the anatomical condition likely to encourage the mixture of pus with the blood, where suppuration occurs in the neighbourhood.

Case cxx. E. K., aged about 45, a sailor, having just returned from a long voyage, indulged himself in excesses of all kinds for many days together. He had been the subject of stricture previously. While living in this way, one morning, retention of urine came on, but in the evening he passed a little water; but a few days before this date he had suffered from a severe shivering fit. On the fourth day after retention began, the scrotum and penis began suddenly to swell, and it was obvious that the urethra had given way, and it was in this state that he was admitted.

I gave him chloroform and succeeded in passing a catheter, and then made some free incisions into the scrotum, and afterwards gave him some stimulus in the form of gin. He went on for a few days, occasionally better, at other times worse, and

a large slough formed on the scrotum and perineum, discharging pus of a very fetid nature; and he gradually sank on the twelfth day after his admission.

At the *post mortem* examination, besides the slough in the superficial parts visible during life, we found a sloughing condition of the whole length of the urethra, which was black throughout.

This was clearly one of the cases where abscess formed outside the urethra behind the stricture, in consequence of great irritation produced by the patient's mode of life, and where the canal gave way suddenly and extravasation followed.

Case cxxi. W. C., aged 49, the subject of an old stricture, which had undergone various treatment, found that the difficulty of passing water increased suddenly, and soon afterwards he noticed that the scrotum began to swell. This was followed by pain, shivering, swelling of the penis and perineum; and in this condition he was admitted under my care. I opened the perineum and scrotum very freely, and also the penis, on which a spreading black patch had formed. His pulse kept tolerably good, but the local condition did not mend, although the slough on the penis did not extend much. He gradually sank, and died on the twentieth day after his admission.

Nothing worthy of any special notice, besides the local damage, was found at the *post mortem* examination.

Remarks. As some operative measures were requisite in the management of these cases of extravasation of urine, I thought it fair to introduce them here, although they would hardly be included in a systematic work on operative surgery. The results were as good as usual in such very severe aud generally unsatisfactory cases, for six recovered out of ten. There are few professional emergencies which we have to deal with requiring more skill and patience and surgical courage, than these wretched accidents of urinary infiltration; occurring, as they generally do, in men of broken down health and dissipated habits, in whom an ordinary cutting operation would very probably prove fatal. This accident, I suppose, is in these days almost unknown in the middle and upper classes of society; but, as the foregoing list will prove, among the lower classes in large cities they are not very rare.

In performing tho necessary operations in theso cases, the froo incisions should be mado *before* the attempt to introduce the catheter, for the urino and serum, and pus if it is present, soon leak out of the tissues, and the tension is taken away from the urethra immediately, and the catheter is more likely to pass readily into the bladder. I have on more than one occasion been ablo to pass an instrument after the perineum has been opened, having failed immediately before.

In each of the successful cases, the patient was ablo to make water much more freely than before; in other language, the extravasation of urine was the perilous and complex method in which nature attempted to cure the stricture and the retention; the narrowed urethra sloughs, and a better one is made, provided the patient has strength to undergo the process and to survive it.

Hemorrhage from the Urethra. I have had under my care two cases of severe hemorrhage from the urethra; and as they are productive of considerable anxiety to tho surgeon, and much alarm to the patient and his friends, I will describe them here, without numbering them among the cases of operation, with which they cannot be classed.

The first was aged 44, and the hemorrhage came on suddenly four days after a catheter had been passed. He was brought to the Infirmary after he had lost a considerable quantity of blood, and had tried various means to stop the bleeding. A full sized catheter was introduced, and kept for some time (a quarter of an hour) in the urethra, and the bleeding ceased entirely.

The second occurred in a young man in whom I had passed a catheter (No. 8) twenty-four hours before at my house, and he had walked home easily; no mark of blood having appeared at the time the instrument was used. I received an urgent message to go to see him, and found him faint and pale, sitting in despair, with his drawers and trousers saturated with blood, which had commenced to flow without any pain or exertion ou his part. After getting rid of all his incumbrances, I rolled up a hard pad, and put him to sit with his bulb pressing upon it, for I knew that the stricture was there; and I gave him half-drachm doses of turpentine every two hours, and he had no further bleeding.

The blood in these cases came on some time after the use of the instrument, namely, four days and one day, and is therefore likely to be more obstinate than when it occurs at the time. Ulceration in the mucous membrane and an aperture into the vascular part of the spongy body are the pathological conditions giving rise to the symptoms.

My two cases illustrate well the effect of pressure applied internally and externally, and I believe that by one or other or both of these methods hemorrhage may be checked readily; and I may add, that turpentine is the best styptic; so much so, that in a case where an operation was called for and loss of blood to be avoided, I should like to give my patient half an ounce of turpentine about half an hour previously; but this I have not yet had occasion to do.

Amputation of the Penis. CASE CXXII. W. D., aged 43, had for some time great induration and swelling of the prepuce, with ulceration and thickening of the glans penis, commencing eighteen months before his admission, with a small hard point on the inner side of the prepuce. He had always a long prepuce. His general health was good, and the inguinal glands were unaffected.

I was obliged to remove the entire organ down to the pubes. Considerable retraction ensued, and there was active hemorrhage for awhile from vessels requiring a ligature. I attached the skin to the mucous membrane of the urethra by three sutures. He went on well until the evening of the fifth day, when hemorrhage came on, and I had to tie a portion of the corpus spongiosum, from which the blood flowed freely. He lost a large quantity of blood in this way. The wound soon healed; but there was some disposition for the opening of the urethra to contract; and when he went out, he was directed to pass now and then a portion of bougie. I never heard that the disease returned.

In connexion with this case, I may mention one also involving loss of the penis, which I can scarcely describe as an operation case. A married man, aged 23, the father of a child or two, came under my care, having suffered for nearly two years from chronic phagedenic ulceration, which had eaten away nearly all his penis. I applied nitric acid (under chloroform), and gave him good diet; and, as this application failed,

I applied a saturated solution of the chloride of zinc, under which the parts healed rapidly, leaving two irregular pendulous portions, which I considered to be stumps of the *corpora cavernosa.* They were about half as long and thick as my little finger, and seemed to have but little vitality, and no relation to the urethra; and, as they were sore and inconvenient, I cut them off, leaving him in the same condition as the man whose penis I had amputated for malignant disease. A smart hemorrhage followed this little proceeding, but it stopped; and he was discharged; cured, I may add, of his disease, but quite shorn of his penis.

Circumcision. Case cxxiii. J. B., aged 10, admitted with congenital phimosis. The urine came with considerable difficulty through an opening about as large as a pin. I passed two needles through the prepuce, cut it off, divided the mucous membrane, and stitched it back in place. The sutures were removed the third day, and he was soon cured.

Case cxxiv. J. C., aged 10, with congenital phimosis. The operation was performed as in the other case. The sutures remained until the third day, and the boy was cured.

The following cases are where the phimosis was acquired.

Case cxxv. A. B., aged 11, was bruised two years before his admission, and phimosis gradually ensued. The operation was performed as usual, two sutures being used. He went out cured in a few days, much pleased with his power of making water freely.

Case cxxvi. J. S., a blind lad, aged 18, received a kick when he was ten years old, and since that time he had increasing difficulty in making water; the glans and prepuce were adherent, and the orifice almost invisible. In this case, I was obliged to cut through the prepuce, and then strip and dissect it away from the glans; and, after passing two needles through it, I removed it completely, tying the threads so that the wound was lessened. The stitches were removed on the fourth day. It was requisite to dilate the orifice of the urethra occasionally with a bougie, as the healing took place; and I directed him to pass a piece of it now and then after he went out. He made water in a good stream.

Case cxxvii. J. H., aged 20, with phimosis of eight years standing. The operation was performed by slitting up the

prepuce, cutting it off, and bringing the skin and mucous membrane together. One vessel bled so freely that it required a ligature, and as it healed he suffered considerable pain. The ordinary lotion of the acetate of lead proved to be the most comfortable application. He was soon cured.

Case cxxviii. D. S., aged about 40, with phimosis of some years standing. In this case, I slit up the prepuce, cut it off, and sewed it up. It healed, but not quite so quickly as usual; for the man's skin was quite covered with an eczematous eruption, which interfered with the cure.

Case cxxix. A. N., aged 36, was admitted with ulcered leg, phimosis, and, besides, a scar almost closing the urethral orifice; and the latter inconvenience was so great that he asked for relief, which he easily obtained by my slitting up the opening of the urethra with a sharp pointed bistoury. The result of this operation, and his increased freedom in making water, relieved him so much that he asked me to circumcise him, an operation I had before advised him to undergo. I therefore passed in some needles, trimmed off his superabundant prepuce, and stitched the parts together by means of six sutures. The wound soon healed.

Case cxxx. A. C., aged 14, bruised his penis six weeks before admission, at which date he had phimosis, with much induration and swelling. After using various means to get rid of the inflammation and thickening, I circumcised him, and he was speedily cured.

Operations for Hydrocele and Diseased Testicle. In the following statement of cases of the cure of hydrocele, I have made no note of those which were simply tapped and sent away. They are narrated in the order in which they occurred.

Case cxxxi. B. D., aged 36, had been already tapped once, but the fluid returned, and the swelling interfered with his work. I injected half a drachm of the compound tincture of iodine, with a drachm and a half of water, after removing the fluid. He complained of much pain afterwards, and by the fifth day the scrotum was almost as large as before the operation. The swelling from this time gradually subsided, but he was not cured completely until six weeks had elapsed.

Case cxxxii. J. F., aged 52, had a hydrocele of only a few months standing. I tapped it, and drew off some dark

coloured thin fluid, followed by flakes of fibrine; and injected a drachm and a half of the compound tincture of iodine, to two and a half of water. In three weeks the tumour was as large as over, and hard; and I repeated the tapping and injecting, with an exactly similar result. Some time after this, finding no disposition in the tumour to shrink, I laid open the tunica vagiualis, under chloroform, and found a surface covered with gelatinous lymph, the result of the former operations. This surface was wiped dry with a sponge, and filled with lint. The wound gradually closed, and he was cured.

This was originally a mixed case of hydrocele and hematocele. The examination of the fluid that was drawn off showed chiefly broken down blood-corpuscles; and it would have saved the patient some weeks residence in the Infirmary, if I had laid open the cavity at first.

Case cxxxiii. W. H., aged 17, had been tapped twice before I saw him, but the disease had returned. I injected half a drachm of tincture of iodine to a drachm and a half of water. In two days, the swelling was as large as ever; but it soon subsided, and he went out cured.

Case cxxxiv. J. J., aged 50, had been frequently tapped for hydrocele of the right side, and had undergone an operation for strangulated inguinal hernia upon the same side. I tapped and injected the hydrocele; on the third day, it was as large as ever, but it soon shrank, and he was cured.

Case cxxxv. A. S., aged about 40, had been already tapped, without a cure being effected. I tapped, and injected the iodine; and he was cured in about two weeks.

Case cxxxvi. T. K., aged 58, a sailor, much accustomed to have his hydrocele tapped. I injected the solution of iodine as usual, and within an hour it was found in his urine. After the return of the swelling, it again subsided, and he was cured in about a fortnight.

Case cxxxvii. M. B., aged about 35, had a small hydrocele, which he was anxious to get rid of. I tapped it, and introduced on a probe a grain of the nitric oxide of mercury. He suffered little or no pain; and he went out cured, without any further return of the swelling.

Case cxxxviii. The last case, in which the nitric oxide was used instead of tho iodine, was so successful that I determined to try the plan again, and used it on this patient, who had a

hydrocele about as large as an orange. He was twenty years of age. The operation was as before and he went on well for two days, when excessive inflammation came on, requiring leeches and fomentations; and the scrotum became very red and painful, and suppurated at the upper part. He suffered a great deal of pain and constitutional disturbance, but was eventually quite cured.

Case cxxxix. The pain and prolonged inflammation which the last patient suffered made me give up the nitric oxide plan and return to the iodine, which had never failed me. I therefore tapped and injected as usual this patient, and he was soon cured.

Case cxl. B. C., with large hydrocele of the right side. It was tapped and injected as usual, and its subsequent course was satisfactory.

Case cxli. T. M., aged 40, had also a very large hydrocele of the right side, from which I drew twenty-four ounces of serum glistening with cholesterine, and injected one drachm of compound tincture of iodine to two of water. He was speedily cured; and in this instance there was but little of that swelling that is generally the immediate consequence of the injection, before absorption and adhesion took place.

Remarks. I have nothing new to report respecting the operation. I always make a puncture with a lancet before introducing the trocar; and I believe that, for the radical cure, the plan of iodine injection is the best. The little that I have seen of the mode of treatment by wires has not been encouraging.

Castration. Case cxlii. J. W., aged 33, with ulcerating carcinoma of the right testicle, of two years standing. He was a weak, unhealthy subject, with shortness of breath and enlarged spleen. I operated under chloroform, and removed a large hard testicle, with the adherent and ulcerated skin. I stripped it up from the subjacent textures easily, and divided the cord last. Two vessels required ligature; and I inserted two sutures, to bring the parts together, leaving the wound partially filled with lint. Notwithstanding this, bleeding came on at night; and the wound was opened, and one vessel required to be tied. This retarded his progress, and he seemed to be long recovering himself. He went out quite well,

after about six weeks stay; and I never saw him again. The microscopic appearance was very characteristic.

In connexion with the foregoing case, I may briefly mention another, in which the patient appeared much more affected in his general health and the local disease seemed worse, but who was, nevertheless, cured completely without operation. A man was admitted under my care with a large ulcerated swelling of the scrotum upon one side, which had existed many weeks, and which had a dark, unhealthy aspect, and discharged sanious matter with the most fetid odour. At the first view of his case, I thought the disease must have been of a malignant character; for, besides the local disease, the man was sallow, extremely emaciated, with hectic, and he had enlarged inguinal glands. The history, and the appearance of laminæ in some of the edges of the tumour led me to suspect that it was not cancer; and the result proved that it was hematocele, following a blow, which had suppurated; and the layers of hard fibrinous matter, which clung in concentric order to the sides of the tumour, as is the case in aneurism, were being destroyed and cast off. I assisted in this process with the scissors and forceps, and ultimately removed the whole disease, leaving a healthy testicle behind; and, with the aid of wine, quinine, and cod-liver oil, he regained his health entirely.

It has appeared to me that hemorrhage has followed a few hours after the operation for diseased testicle so frequently, that on future occasions I should prefer to leave the wound entirely open, and allow it to granulate, as in the case of hematocele.

Operations upon the Female Organs.

Removal of Enlarged Clitoris. Case cxliii. J. W., aged 21, had a swelling of the size of an apple at the upper part of the fissure between the labia, apparently resulting from gonorrhœa. I removed it by simple incision; and, upon examination, it appeared to consist chiefly of an enlargement of the clitoris, especially of the *preputium clitoridis*, with effusion of fibrin and serum. The divided vessels bled very freely, and three required ligature. She went out cured in a few days.

Case cxliv. C. C., aged 25, was admitted with a tumour of the clitoris, of the size of an orange, with an irregular warty surface. I removed it by incision; and there was copious

hemorrhage from numerous vessels, which sent out the blood with considerable force in every directien. Four were tied, and lint dipped in turpentine applied over the surface. She went out cured, but not for some weeks, as there was considerable induration in the surrounding parts.

Case cxlv. M. D., aged 59, was admitted with a tumour of a vascular nature at the orifice of the *meatus urinarius*. It was not so red and vascular as the smaller tumours seen at that part. I removed it, and it was about as large as a filbert. I tried to cut through its base with the galvanic cautery at first; but the wire would not pass through, and I therefore cut it off with a knife and tenaculum, and cauterised the bleeding surface with a heated galvanic wire. A catheter was placed in the urethra.

Within three weeks the disease had returned, and it was necessary to operate again; and therefore, after removing it, I applied potassa fusa to the part, and made a considerable slough. This had the desired effect; and she went out well, and was well some years afterwards, when I last saw her.

The age of this patient was against the idea that the tumour was one of the ordinary vascular tumours at the orifice of the *meatus urinarius*, and I believe it to have been an epithelial cancer. I much regret having kept no record of the microscopic appearance of it.

I have also treated three cases of the ordinary vascular tumour with scissors and the application of caustic to the cut surfaces; and all with success. In one, the growth extended into the canal; but, upon firm traction, the whole of it could be reached. There was nothing very specially worthy of record in their history; one of the patients was upwards of forty years of age.

Epithelioma of Vagina. Case cxlvi. This was a woman about fifty-five years old, in whom a tumour had been growing for some years from the anterior wall of the vagina, near its orifice. She was married, but had never been pregnant. There was a good deal of induration about the part. I removed a considerable portion of the mucous membrane with the diseased surface by means of ligatures, passing a needle armed with a strong thread through its base; and, as soon as the slough came away, I touched the parts repeatedly with a saturated

solution of the chloride of zinc, under which treatment the disease seemed to yield, and I ceased to attend her. I am sorry to say that I have had no opportunity lately of hearing how she is; but, many months after the application of the caustic, her husband told me that she was much better.

Obliteration of the Vagina. CASE CXLVII. E. C., aged about 25, had suffered from sloughing of the vagina from protracted labour, and the opposite surfaces afterwards united. She had undergone an operation with a view to restore the cavity; but the only result was to open the bladder near its neck, thus making a fistulous opening.

I applied a red hot iron to this opening; and, with a finger in the rectum, I attempted to cut open a cavity that should avoid the bladder and reach the uterus. After a long trial, I failed, and could not reach that organ, as so much of the substance of the vagina had been lost. A plug was inserted into the opening made, and it seemed more promising; but after a few days she became discontented, and went home. I afterwards heard that other attempts of a similar kind were made on her, with a like result.

CASE CXLVIII. E. B., aged 22, a tall country girl, suffered from periodical pain in the lower part of the abdomen and inguinal regions, but without tumefaction. There was no trace of vagina, the urethra was normal, but the nymphæ joined together below, instead of being separated by a cavity.

I operated; and, with a catheter in the urethra, cut below into the cellular tissue between the rectum and urethra; and, after stripping away the parts for some distance, I felt something hard like the os uteri, as if it was covered with a thick membrane. I therefore drew down the tissues with a forceps and hook and divided them carefully; the tissue was very hard and white. After doing this several times and exposing the hard body to the finger more distinctly, I suddenly cut into some cavity, and a small round mass dropped out like a piece of jelly; and I at once concluded that I had arrived at the os uteri, and that a plug of mucus had escaped. Upon introducing the finger, however, it passed through an aperture into a cavity, in front of which could be felt a smooth hard body, like the back of the uterus; and I was persuaded that I had cut into the peritoneal cavity, and this alarming idea was much

strengthened by our discovery that the clear mass which escaped was a genuine hydatid.

No bad symptoms followed. She went out in about three weeks, with a cavity that felt to the finger exactly like the natural vagina; and I directed her to wear a boxwood plug, to keep it open.

I have been unable to get any accurate account of this patient since she left my care; but the prospect was not very promising.

Stone Cases. This last sub-division of the operations in the genito-urinary system includes lithotomy and lithotrity, and I shall describe them in the following order, viz.: cases of the lateral operation, of the median section (Allarton's), lithotrity, and two cases in the female subject.

CASE CXLIX. A. C., aged 11, had been troubled with symptoms of stone all his life, and occasionally had passed small bits of gravel. His symptoms were severe when I saw him, and he had considerable hæmaturia. I performed the lateral operation in the usual way, having given him a dose of castor oil in the provious day, and removed an oxalate of lime calculus weighing a hundred grains. The operation was completed in a minute and a half. He went on without any bad symptoms of importance, the wound was entirely healed in a month, and he was discharged cured.

CASE CL. C. P., aged 8, was suffering severely from the symptoms of stone when I saw him. I performed the lateral operation speedily and easily, and removed a lithic acid stone weighing seven drachms. The water flowed through the wound until the fifth day, when it began to come by the urethra. He was cured in little more than a fortnight.

CASE CLI. E. H., also aged 8, was under my care at the same time as the last patient, and I operated upon him on the same day, and removed a very small stone. During the whole of the next day the water flowed through the urethra, but afterwards through the wound. He went out well in about six weeks. The stone was oxalate of lime.

In the first of these two last cases, the stone was very large for so young a subject; and in the second, it was very small; but both recovered perfectly well, and in about the same time.

CASE CLII. B. G., aged 7, with very severe symptoms of stone.

In this operation I entered the groove in the staff at the first cut, and the seeond penetrated the bladder in the usual lateral method. I removed a large soft phosphatic calculus weighing six drachms. The stone erumbled under the foreeps, and I therefore washed out the blood afterwards, and, as there was tolerably free hemorrhage, I introdueed a portion of a gum elastie eatheter, and plugged the wound around it with sponge. This stopped the bleeding at onee. He went out eured in about four weeks.

The eatheter surrounded by the sponge was of very great use in this ease, for it stopped the flow of blood, and enabled him to keep the bed dry, by letting the end of the catheter rest in a dish.

Case ciii. E. H., aged 34, a rieketty and strumous little barber, had suffered more or less from stone symptoms all his life, and for five years before I saw him they had been very severe. The stone was very easily diseovered by the sound. I tried to crush it, but eould only toneh it with the points of the blades of the lithotrite, and, therefore, was obliged to perform lithotomy.

I nsed a large straight staff, and eut down at once upon the groove, but when I made the next eut, whieh should have entered the bladder, I found that it did not pass freely; in fact, the staff had slipped out of the bladder. This was fortunately remedied at onee by passing a eurved staff instead of the other, and it entered readily, and I eompleted the ineision of the prostate. The finger having been introdueed into his bladder, the stone did not fall down as usual npon it, although it was, in sounding, always felt near the neek of the bladder, and always in the same spot.

There was extreme diffienlty in laying hold of it, and it eould only be done by getting an assistant to press very foreibly with the hands in the hypogastrie region, and when I had hold of it with the foreeps I eould neither rotate it nor move it. I therefore broke it with the strong forceps with a screw handle, and extracted it pieeemeal. It was evidently adherent at the anterior part. He lost a good deal of blood. The stone was phosphate of lime and magnesia and ammonia, with a nueleus of oxalate of lime, and an external layer of phosphate of ammonia and magnesia, that is, a mulberry ealeulus inside, then fusible calculus, and then externally triple phosphate, and the fragments

weighed *twenty drachms and a half.* He was nearly an hour under chloroform on the table. As he recovered, which he did without any very troublesome symptoms that could be referred to the operation, he suffered from constipation for sixteen days, and this yielded to an injection of ox-gall, after nearly everything else failed. No water passed through the urethra for thirty-eight days after the operation. He went out in about seven weeks, and lived well and comfortably for some time. Nearly five years have elapsed since the operation, but I heard lately that my patient has recently died.

This case was one of adhesion of a large stone to the anterior surface of the bladder, and presented very great difficulties. The great length of time which elapsed before the water came through the urethra was due to the injury inflicted in the parts by the passage of so many instruments, and the extraction of so large a stone in such rough fragments.

Case cliv. J. F., aged 5 years, had very severe symptoms of stone for a few weeks before his admission, having suffered altogether for eight months. He had a very narrow perineum, even for so young a child. I performed the lateral operation, and cut into his bladder without difficulty, and in a short time extracted a lithic acid calculus weighing a hundred grains. There was less bleeding than usual. He was restless the next night, and no water passed from the wound; and therefore, the next day, I oiled my finger and passed it through the wound, giving an escape to some urine and some small coagula. His respiration was hurried. I treated him with a little stimulus, and some opium in small doses, but he grew worse, and died on the sixth day after the operation. His most prominent symptom was cough and difficulty of breathing.

Post Mortem Examination. The bladder was much thickened, looking like a small uterus; its mucous membrane was ulcerated and red in patches. There was effusion of urine between the bladder and the abdominal parietes, and into the cellular tissue of the pelvis, with a formation of unhealthy pus. There was also acute pleuro-pneumonia of both lungs; the lower lobe of the right lung sunk in water, as did separate portions of the left lung.

The cause of death here was undoubtedly an extravasation of urine into the cellular tissue of the pelvis. The section through the prostate did not appear to the finger to be as ex-

tensive as it was in some of my former cases, particularly the first (Case CXLIX), where tho patient's recovery was uninterrupted. I lost, therefore, in my cases of lateral lithotomy, one patient out of six.

Median Lithotomy. Case CLV. W. H., aged 11 years, was admitted under my care with symptoms of stone, which had existed for nino years. I performed the median section with the fore finger of the left hand in the rectum supporting the staff, and using a sharp pointed knife, the edge directed upwards. I punctured the membranous portion of the urethra and incised it. The finger followed a probe readily through the prostate, and two stones were easily extracted. They weighed about 165 grains, and were composed of lithic acid and lithate of ammonia. The next day the boy had regained the power of holding his water, and some came through the urethra, and he went on perfectly well in every respect until the seventh day, when he had a rigor, and on the next day following an eruption like the nettle rash came out. He became rapidly worse, and died, with symptoms of pyæmia, on the eleventh day after the operation.

Post Mortem Examination. The body had begun to decompose, although the examination took place twelve hours after his death. The bladder was thickened, but not unhealthy. The wound in the urethra was a neat clean cut, about three-quarters of an inch in length, extending as far as the prostate, but no further, and all the parts connected with the operation seemed in a satisfactory state.

That the boy died of pyæmia there was the following evidence: pus (in small quantity) in the anterior mediastinum; purulent lymph over the pleura of the right side; round deposits of thick pus in and upon both lungs; reddish pus in the left ankle joint, and between the os calcis and astragalus; a muddy thick coagulum in the veins of the left leg, and redness of the left femoral vein.

Case CLVI. G. D., after 56, a carpenter, a tall, stout man, was admitted as my patient with very severe symptoms of stone. The case having been published in the Journal (May 15, 1858) at length, I need only repeat that upon sounding him it was very difficult to detect the stone; but on operating (by the median section) I removed two soft phosphatic stones, con-

taining soft greenish extraneous substance in their interior, and this turned out to be portions of *leek* which he had passed into his bladder to relieve retention. He remained my patient for four months, and in that space of time I cut him four times and removed six stones, and he went out perfectly well on the sixth day after the last operation, and has remained quite well, two years at least having elapsed since that time.

Each of the operations on this man was extremely difficult, owing to the depth of his perineum and his enlarged prostate. I never heard of any other case where the same patient had undergone lithotomy four times, and I have not the least idea that this man could have survived four lateral operations.

Case clvii. H., aged about 30, broke a gum elastic catheter in his urethra three weeks before I saw him. An incision was made, but the foreign substance escaped into the bladder. When I saw him he had, besides the extreme irritation of this body in his bladder, the much more serious complication of extravasated urine into his scrotum and perineum, with a sloughing wound, and a great state of general collapse. I made the median section, and after a long and painful trial with various instruments, succeeded in laying hold of the bougie, and extracted it. There was little or no hemorrhage, and from this time the patient improved. He had one or two drawbacks in the form of diarrhœa, but eventually he recovered well.

It has been seen, by some of my former cases, what are the perils of extravasated urine, and when these are added to the risks of a lithotomy operation in a very irritable and depressed condition of the system, it must be admitted that this patient narrowly escaped with his life. It is, in my opinion, very probable that the substitution of the median section for the lateral operation, by not interfering with the deep tissues at the neck of the bladder when the superficial ones were filled with urine and pus, may be considered the saving point in his case.

Lithotrity. Case clviii. J. W., aged 44, was admitted under my care suffering from fistula *in ano*, which had existed for eighteen months; he also had partial paralysis of his lower extremities and some difficulty in passing water, due to paralysis of the bladder. Upon drawing off his water one day, one of my pupils discovered that he had a stone in his bladder, but his symptoms were not very urgent, probably because the

nerves of sensation supplying the part were as much deadened in their power of conveying sensibility as his motor nerves were in their functions.

At the first operation I seized the stone readily, for his bladder retained the water easily, and crushed it, and then took hold of several pieces and crushed them without any difficulty. The scoop was then introduced, and the water and some *debris* allowed to escape, but upon withdrawing the scoop I found that a piece of stone had hitched in it and it would not pass into the urethra. There is no contrivance connected with this instrument for the purpose of dislodging a portion of calculus impacted in it, and I was much puzzled, trying various means, probably for twenty minutes, and at last it was dragged through the urethra with some force, causing a discharge of blood. It was a large square piece of stone. A rigor followed this operation, but no other inconvenience. He passed a great many pieces of stone without difficulty, and was relieved in a great measure of the few symptoms he had.

I operated again in twelve days, and crushed three or four portions of the stone with great ease, and this was also followed by the discharge of *debris* to a considerable extent.

I operated again in little less than a month, crushing three pieces, and a few days afterwards he passed a large bit and many others; the large portion required to be removed by the house surgeon from the orifice of the urethra.

The crushing was repeated after this no less than *seven times*, and always with the effect of bringing away a considerable quantity of stone, and he had many pill-boxes full of fragments which he had collected. The treatment was very prolonged, for it was now and then interfered with by attacks of gout, to which he was subject; but ultimately the whole mass was got rid of, and none could be found in the bladder, and his symptoms ceased. He died of cerebral disease some months after he went out, but he had no return of any urinary difficulty.

This patient was an excellent one for a first case of lithotrity, for he had a large urethra and a capacious bladder, and his mucous membrane was very tolerant of the lithotrite and rough stones.

CASE CLIX. R. S., a fine healthy old man, 78 years of age, was under treatment at the same time as the last patient. He

had suffered severely from stone, and was willing to undergo any operation.

At the first crushing I found an extremely hard stone, measuring, in the diameter by which I held it, an inch and an eighth. I broke it up, and removed some by the scoop, and several pieces passed in the night. The stone was hard, laminated, and composed chiefly of oxalate of lime. Many large pieces came through his urethra, being caught at the orifice, whence they were dislodged, but sometimes with some difficulty. This patient was operated on five times, and at last completely cured, and although he was so old, I have seen him, now some years after the operation, walking about actively, and quite cured of his disease.

Case clx. J. B., aged 45, was suffering excessively from symptoms of stone when I saw him, for, in addition to the ordinary inconvenience of this malady, he had stricture of the urethra, and formerly had suffered from perineal abscess, leaving a fistulous opening, and, as if this was not a sufficient amount of irritation, his medical attendant had been applying nitrate of silver to the bladder to cure it of the chronic inflammation, and by this means it had become acute.

I caught and crushed a soft stone with Charriére's small lithotrite, and found that at two measurements (at each of which it was crushed) it was three-quarters of an inch in diameter. He passed a considerable quantity in the night, and the next day told me that he was " a thousand pounds better." The operation was repeated three times more, and he was then cured, and instead of being a man broken down in health, suffering excessively, and almost sinking from his disease, he is now, six years after the operation, as he has been ever since, a strong and energetic man, able to attend to an active business with comfort.

Case clxi. W. I., aged 16, an unhealthy strumous lad, who had suffered from stone symptoms for nine months, was admitted as my patient, and having been encouraged by my former cases, I determined to try lithotrity in him.

After the first crushing he passed a great many pieces, and his sufferings were relieved; but after a second operation, this time under chloroform, although he passed many pieces of stone, he suffered great irritation. This was relieved by barley water, and a little alkaline medicine, with an opiate at night, and he

became better, but there was evidently more stone in the bladder. At his earnest request I let him go home into the country, with the promise to return in three weeks to have his case completed; but after a considerable time, not hearing anything of him, I sent to inquire, and found that he was dead. No particulars of his condition before death were obtained.

I think that this patient's case was really more adapted for lithotomy than lithotrity, and under similar circumstances, I should, for the future, adopt that method; but he seemed more unhealthy in his general condition than the state of the bladder would account for, and I was, therefore, unwilling to run the additional risk of the lateral operation, which was the only cutting operation for stone in vogue with us at that time.

Lithotrity in the Female. Case clxii. M. P., aged 11, had suffered from symptoms of stone all her life, but they had much increased for the few weeks preceding her admission. I operated on her with the most convenient instrument we had at that time, namely Charriére's small lithotrite for the male subject, and crushed a stone of an inch and a quarter's diameter by the direction I held it. No bad symptoms followed; some pieces came away, and a considerable quantity of white and hard crystalline ammonio-phosphate of magnesia. I operated three times more before she was cured, and each proceeding was accompanied by the discharge of *débris*, and on one occasion of considerable bits of stone. She was dismissed cured.

A peculiarity in this case was the great capacity of the bladder for a girl of 11 years. I once introduced the instrument in my search for the stone, until, from the length, its extremity must have reached to the umbilicus, but no stone could be found; but, after passing a catheter and drawing off twenty ounces of water, I found it readily.

Removal of a Foreign Substance from the Female Bladder. Case clxiii. J. B., aged 30, was admitted one morning under my care, saying that, as it was hot weather, she got out of bed and sitting down upon her work-bag, felt something run into her body. I found a foreign substance in her bladder, which turned out to be what she knew it was, the handle of a crochet-needle, and by holding it with a forceps I was enabled to thrust

the point into the vagina, and after cutting down upon it to bring it through. She recovered without any further difficulty. The instrument was the ivory handle of a needle, four inches in length, tapering to a sharp point.

REMARKS. I have but few observations to make upon the operations for the removal of stone from the bladder. It is not likely that I shall ever perform the lateral operation again, except upon the dead subject, as a demonstration to the students, for I cannot imagine any circumstances that could induce me to return to it. My own few lateral operations have been much more speedily performed, and have looked much better than the others, and I met with an average share of success in them; but the real question to be considered is the patient's safety, and this is undoubtedly best observed by the median cut. A surgeon would naturally say, at first, that the new operation would do well for small stones, but not for large ones; but now there is ample experience to show that large ones may be removed by this method without injuring the tissues, and with such experience before them, it is surprising that surgical professors should still be found to teach that it is more dangerous to stretch than to cut the prostate.

It is always considered advisable that the patient should have a certain quantity of water in the bladder at the time of the operation, and the simplest plan is to direct him to pass water at a certain time, say one hour, before the time fixed for the operation, and in this way a sufficient quantity is secured.

Now that a short lithotrite is made, and the instruments are more effective, the operation of cutting in the female must become very rarely, if ever, necessary. With a large, short, and dilatable urethra, the circumstances are those which are best adapted for lithotrity.

In these latter operations in the male subject, I have been surprised to find how much better the patients feel from the date of the operation, although but little has escaped; this is because the weight of a broken stone is diffused over a larger surface than the same weight in one piece.

I think that the *scoop* to draw off the water, and stones, and *débris*, after an operation, is of no real use; and, according to my experience, it is better to break the stone, and let nature expel the pieces. In the case of an accidental dilemma such as

that in which I was placed in one of these operations, viz., with a large piece of stone impacted in the blades of the scoop, it might be detached by the following simple method; which, however, did not strike me until I had dragged a large and rough fragment through the urethra of my patient; but he, fortunately, was not very sensitive in those parts. The plan would be to open the blades as widely as possible, turn the instrument round so that the stone could drop out, and give it a smart tap near the part entering the urethra; and the shock of this blow would inevitably shake off the fragment.

Of the lithotrites in ordinary use, the English ones, as, for example, those made by Weiss, are the strongest and best in many respects; but there is one contrivance connected with the French instruments which is of great value: namely, that when the stone is seized by the French lithotrite, the screwing and crushing may be commenced immediately, by an ingenious mechanism at the handle of the instrument; but, with the English instrument, the surgeon must turn the screw until it travels down to the upper blade of the lithotrite, before the pressure will tell upon the stone. This involves, possibly, an inch of screwing; and I have many times seen a stone slip away in this interval, the surgeon paying more attention to turning the screw than to holding the stone. An Anglo-French lithotrite, combining the advantages of both, would be the best.

I have had some bandages made, which I call my *lithotomy straps*, intended to supersede the red webbing bandages by which the hands and feet are bound together in these operations. These straps consist of padded leather bracelets fitting to the wrists, and buckling firmly round them; and some firm leather anklets, of the shape of the elastic bandages for the ankles, which can be buckled on over the ankles. The bracelets have a strong hook on the middle of their palmar aspect, and opposite each outer malleolus is an iron ring. The bracelets and anklets being put on when the patient is in bed, as soon as he is under chloroform, or the staff is introduced, the hooks are passed through the rings, and all is done. He is in like manner relieved from his irksome posture in an equally short time.

V.

OPERATIONS ON THE EYE.

I HAVE arranged the operations on the eyes under the fifth general division of my operative cases; but, upon looking over them for the purpose of further classification, I find that they are so numerous that any particular account of each case is quite out of the question. They are probably more in number than all my other operations put together; and since, according to my own experience, the tabular form does not give a reader any inducement to persevere in his studies, I have avoided it, and have written most of them out *seriatim*, as briefly as possible, merely indicating the sex by the letters M and F. Many of the cases may appear trivial to my experienced readers; but they shall be very short, and are comparatively few; for the greater number of the minor ones have escaped any accessible record. I have in these papers been anxious to give a true idea of our surgical proceedings in connexion with a provincial hospital, and have therefore included slight as well as severe, and unsuccessful as well as successful cases.

It is necessary to subdivide my ophthalmic cases into ten groups; and, even with this classification, it has been requisite to omit all the little tumours of the lids, serous cysts and operations for pterygium and fistula lacrymalis. The groups are, the Extraction of Cataract (in one eye and in two—first the successful, and then the unsuccessful cases); Needle Operations; the Removal of Hard Capsule and Dislocated Lens; the Formation of Artificial Pupil; the Mixed Cases, or those requiring several various operations, which will not allow them to be included under the former heads; Operations for Staphyloma; Strabismus; Extirpation of the eye; and lastly, Operations for Ectropion, Entropion, Trichiasis, and Ptosis.

The period of time in which these eye operations were performed extends further back than the ten years.

Extraction of Cataract. Case clxiv. M., aged about 50. (This was my first cataract case.) Left eye amaurotic from a blow; right lens dull; pupil large and inactive. Made an upper section, which was enlarged with the scissors; and the cataract escaped readily. He was bled in the evening for pain in the head,* and recovered well, and was able to work for years.

Case clxv. M., aged about 60. Double cataract. I operated on the left eye by lower section. He recovered without a bad symptom, and went home in two weeks with excellent sight and an active pupil.

Case clxvi. M. Double cataract, of recent formation; the centre only of the right lens being opaque. I made a lower section of the left cornea, the eye rolling inwards, and the point of the knife catching the conjunctiva. The section was satisfactorily completed. The softer part of the lens was left in the pupil; and, on attempting to remove it, there was a gush of vitreous humour to such an extent that it was necessary to fasten up the eye at once. This I do always in the old fashioned way, with a strip of court plaster and light compress, treating both eyes alike, although only one has been operated on. He made an excellent recovery, and could see to read small print with a two-and-a half inch lens.

Case clxvii. F., aged 75. Double cataract. She said that she lost the sight of the right eye suddenly. I made the upper section in the right eye; but, as the iris flapped in front of the knife, I withdrew it, and completed the section easily with the convex-edged narrow knife. She went on well until the seventh day, when she told me that she could not see, and was very ill. I ordered her a purgative, and the next day she was all right. She recovered with good sight.

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* In the days of my apprenticeship to the late Mr. Estlin, it was my duty to see all his operation cases at night, about twelve hours after the operation; and I had the general direction to bleed whenever there was pain in the head, and it always removed it.

Case clxviii. M., aged 60. His left eye was amaurotic, and he had a cataract operation performed some years before by Mr. Estlin, but without advantage. I operated on his right eye by upper section, and a very dark hard cataract was suddenly jerked out upon his cheek. On the fifth day, he struck his eye accidentally; but, with this exception, he went on well. His pupil was drawn upwards to the line of cicatrix, and he was able to see to walk about alone, and ultimately to read. Eighteen months afterwards, this eye also became amaurotic and the iris tremulous.

Case clxix. M., aged about 60, with double cataract and sunken eyes. Upper section in right eye. He made a fast recovery, and had good sight.

Case clxx. F., aged 58. Had two sisters who became blind from cataract, and recovered their sight by operation. I made the upper section in the right eye, the knife shaving the iris. Soft part of lens removed by a curette from the pupil. Went home on the eighteenth day with good sight, but the eye still weak.

Case clxxi. F., aged 67, a little fat old woman, with sunken eyes and double cataract. Right eye affected two years, and the left nine months. I made the upper section in the right eye, extracting a large hard flat amber cataract. (Mr. Estlin then operated on the left eye.) She went home with fair sight, but with weak eyes.

Case clxxii. F., aged 58. I operated on the right eye, and Mr. Estlin on the left; some vitreous humour escaping with the cataract in the latter eye. She was bled at night for headache, and made a slow recovery; good sight.

Case clxxiii. M., aged 60, a corpulent publican, who had had paralysis. I operated on both eyes at the same time. With the right cataract (upper section from behind), a considerable quantity of fluid vitreous humour escaped. Made also the upper section in the left eye, standing in front of the patient. The cataract escaped with no vitreous humour. The next day, he had a severe attack of gout in the knees; but he recovered his sight in both eyes, and died of apoplexy about eight months afterwards.

Case clxxiv. M., aged 71, an extraordinary old man, who had chorea affecting one side of the body, and paralysis of the other, from birth. He was constantly making (involuntarily) the most strange grimaces and contortions of the body, and this he said had continued all his life. He had been married and had a healthy family. It was with great difficulty his head and face could be kept steady. I made an upper section in the right eye, and extracted a dark amber cataract. On the fifth day he opened his eye, which appeared quite strong, and saw to tell the time by my watch in a dull light, and on the sixth day he went home quite well. I never had a case which progressed more quickly.

Case clxxv. M., aged 60. I made the upper section in the left eye standing in front of the patient. Lens escaped readily, and he recovered well, with good sight.

Case clxxvi. M., aged 65. Operated on both eyes, the right by the upper section, and the left by the lower. During the cure, the left lower lid irritated the corneal flap, and rendered necessary two applications of the nitrate of silver to it. Recovered with good sight in both.

Case clxxvii. F., aged 60. Operated on both eyes. In the right the corneal section was small, and the lens showed no disposition to emerge until I had enlarged it with a pair of scissors. She had no very unfavourable symptoms, but her eyes remained weak. She went away, and returned in six months, when I found that she had entropium of both eyes, and prolapsus iridis of the left eye. I took a piece of skin from her lid, and applied nitrate of silver to the prolapsed iris, and she soon recovered and went away with good sight in both. She was also the subject of an immense bronchocele.

Case clxxviii. F., aged 60, a rheumatic subject, liable to headache, with double cataract, sunken eyes, and prominent brows. I operated on both eyes; she had pain in her head at night, but was not bled. When she recovered, she had very good sight in the left eye, and closed pupil and but little sight in the right.

Case clxxix. M., aged 60, lost the left eye by a blow, and the right eye had been getting gradually dim,

when he became suddenly blind. I operated on the right, and made a good upper section. He went on well for nearly a week, when pain, especially at night, occurred, and he had severe inflammation of the eye, requiring active leeching. After three weeks, finding the cornea bulging, and the wound not healed, I passed the curette through the white scar, thinking to remove some *débris* of the cataract, but nothing came away, and the eye healed more quickly. He went away with but little sight in this eye; and when I saw him, six months afterwards, he had closed pupil. I cut his iris with the small iris-knife, and he had immediately a new pupil, which became circular, and he went away with a four-inch glass and good sight.

Case clxxx. F., aged 65. Operated on the left eye, making a lower section. He went home with good sight in eighteen days. The pupil was a little drawn down.

Case clxxxi. M., aged 57, whose father was operated on for cataract eleven years before. I operated on the right eye, making the upper section, which required to be enlarged with the scissors. Recovered with good sight, without a bad symptom.

Case clxxxii. M., aged 72. Mr. Estlin extracted the right and I the left lens. He had a good deal of inflammation in both eyes, which eventually subsided; and, when he returned home to Wales, his sight was improving, but it was still imperfect.

Case clxxxiii. F., aged 60, had been gradually becoming blind for four years. I made first the upper section in the left eye (standing in front), and enlarged it a little with a scissors, and the lens with a considerable quantity of vitreous humour gushed forth, and it required some management to replace the corneal flap. I then made the upper section in the right eye, and the lens and a small quantity of vitreous humour escaped with a little pressure. He went home well, with good sight in both eyes.

Case clxxxiv. F., aged 50., with fully formed cataract in each eye. I made an upper section in the right eye, and extracted a soft white lens. Went home with good sight.

CASE CLXXXV. M., aged 60., with long standing cataract in each eyo. I operated on the left, and when he recovered, he had good sight; but after a time the capsule becamo opaque, and the pupil was drawn down. I therefore operated on tho right eye with a needle, reclining and breaking up the lens. Some inflammation came on, and he was leeched once or twice; but ultimately the eye recovered completely, and he went home with very good sight.

CASE CLXXXVI. M., aged 45, had been growing blind for nearly six years, but he had only given up work a fortnight before I saw him. He had so sunken an eye and so overhanging a brow that it was difficult to operate. I made a puncture in the cornea of the right eye, and finished the section with the convex knife and scissars. He had an excellent recovery, and went away with a circular pupil and good sight.

About a year afterwards, he came up to have the other eye done. I therefore extracted the left lens, and he recovered speedily, and both his pupils were round and active.

CASE CLXXXVII. M., aged about 60. I operated first on the right eye with an upper section, and extracted the lens easily; and then, also by an upper section, I operated on the left eye. On the twelfth day after the operation, he could see the time by my watch without a glass. He went home with a circular pupil and excellent sight in each eye.

CASE CLXXXVIII. M., aged 67, was operated on six years before in the right eye, and recovered his sight for awhile, but it gradually was lost. I made the upper section in the left eye, standing in front; and removed the lens easily. He recovered good sight, and was able to work.

CASE CLXXXIX. M., aged 71. The right eye had been unsuccessfully operated on before. I made the lower section in the left eye; but, immediately on its completion, the lens and some vitreous humour started out upon his cheek. He had excessive spasmodic contraction of his orbicularis palpebrarum. Went home with improved sight.

Case cxc. F., aged 70. Deeply sunken eyes and prominent brows. I operated on both eyes, making the lower section in the left eye, and upper section in the right. She recovered, with very good sight in the left eye; but in the right it was not so clear.

Case cxci. F., aged 63. The right eye was amaurotic; I extracted the lens in the left. She was very faint during the operation, but recovered with very good sight.

Case cxcii. F., aged 65. The left was a sightless eye; the left had been blind from cataract for three months. I made the upper section with difficulty, owing to her unsteadiness; and, as soon as it was completed, she jumped up and jerked out the lens from her eye, with a considerable quantity of vitreous humour. Her eye looked a little collapsed afterwards. She recovered well, and went home with very good sight.

Case cxciii. F., aged 64. I operated on the right eye by the upper section (the cataract in the left was incipient), and removed the lens with a small quantity of vitreous humour. She had a little pain afterwards, and I applied some belladonna at night. She went home in twelve days, with a clear circular pupil and good sight.

Case cxciv. F., aged 73, excessively deaf. I operated on the left eye, and extracted a large amber coloured lens by the lower section. A little vitreous humour followed. She recovered with excellent sight, and could see to read well for four or five years afterwards, when she died. The pupil was a little drawn downwards.

Case cxcv. F., aged 74. I operated on the right eye by upper section, slightly wounding the margin of the pupil. She recovered well, and went home on the eighth day with excellent sight, but complaining much of having been made a prisoner so long. She saw well for some years after, when I lost sight of her.

Case cxcvi. M., aged 71. I operated on the left eye in the month of August, during some of the hottest weather we have had for years. A little vitreous humour escaped with the cataract. He recovered very well, and in seven days was able to open his eye and see clearly.

Case cxcvii. F., aged 56. I operated on the left eye. She recovered well in ten days, although she was a feeble, unhealthy person. A year afterwards, I operated on the right eye (the left remaining quite sound and useful); and she had inflammation following the operation, and went home before the eye had recovered itself. I do not know the result of this second operation.

Case cxcviii. M., aged 58. I operated on the left eye by lower section. On the eighth day, pain in the brow and head came on, and the pupil became irregular and contracted. I gave him some calomel and opium pills until the mouth became sore, when his eye cleared; but when he went home, the sight was still somewhat imperfect.

Case cxcix. M., aged 72. Amaurosis of the left eye, and cataract in both. I operated on the right eye, just touching the iris with the knife, so that it bled. The corneal flap was disposed to fall down under the lid. He recovered with good sight and a circular pupil, although the iris had been touched.

Case cc. M., aged 60. The left eye had been lost in early life by accident. Cataract in the right for two years and a half. I operated on the right, and made the upper section. He recovered well, and went home with excellent sight. This operation was performed in the winter.

Case cci. M., aged 56, with cataract in the right eye of six years standing, in the left only six weeks. I operated on the right. The eye was very tense, and the iris flapped in front of the knife, so that I was obliged to withdraw it, and complete the section with the convex knife. About the fifth day, inflammation came on, and required some active treatment with mercury; and he went back with good sight.

He came back the next year, and underwent an operation on his left eye, the lens and some vitreous humour escaping. He returned home with good sight in both eyes.

Case ccii. F., aged 59. I extracted the left cataract by an upper section, standing in front of the patient; the incision requiring to be a little enlarged with the

convex knife before the lens would escape readily. The flap of the cornea was much disposed to fall down. She recovered with a closed pupil, which I incised with the iris-knife, and she saw well at once. In the course of two years afterwards, the sight became dull again.

Case cciii. M., aged 59, with cataract in each eye, and external strabismus and amaurosis in addition in the left. I operated on the right eye, making an upper section, and extracting the lens easily. He saw my watch afterwards, and recovered with fair sight. A year afterwards, he became amaurotic.

Case cciv. M., aged 54. His left eye was amaurotic. I operated on the right, and extracted the lens without accident. He was well, with good sight, by the eighth day.

Case ccv. M., aged 55. I operated on both eyes; the lower section in the left eye, the upper section in the right. He recovered without a bad symptom, and by the eleventh day his sight was strong and clear in both eyes.

Case ccvi. M., aged 63, with cataracts in both. I was obliged slightly to enlarge the incision in the left, when the lens escaped readily; and then I operated on the right. He had recovered his sight and his eyes were strong by the eighth day.

Case ccvii. F., aged 72. The right lens was tremulous. I extracted the left, and she at once exclaimed that she saw a purple light. She went on well, and recovered with good sight and a regular pupil.

Case ccviii. M., aged 72, a restless and unsteady patient. I extracted first the left by a lower section, and then the right by an upper section; with the latter, a little vitreous humour escaped. On the fifth day, he opened his eyes, and saw well with each; but on the sixth the right became inflamed, and the case terminated by his having good sight in the left eye, and closed pupil, with but little sight, in the right.

Case ccix. F., aged 60. I operated on the right by upper section from behind; and there was so great a strain upon the globe, that a jet of aqueous humour flew into my face. She recovered with excellent sight.

Case ccx. F., aged 58. I made the upper section in the right eye, and she recovered after rather a longer time than usual; but her sight was very good.

Case ccxi. M., aged 55. I operated on the left; and he recovered with excellent sight, and returned to the country to his labour, and came up again the year after, when I operated on the right eye by the upper section, and he went home again on the thirteenth day with very good sight in both eyes.

Case ccxii. M., aged 70. I operated on the right, a remarkably sunken eye; and touched the iris in making the upper section. The lens escaped easily, but there was a little clot in the anterior chamber. Immediately after the operation, he saw blue light towards the right, and red towards the left. On the third day, he opened his eye and looked about, and he went home with very good sight.

Case ccxiii. M., aged 60. I operated on the left; and, finding that I could not complete the section without wounding the iris, I withdrew the knife, and finished with the convex-edged one. Some fluid vitreous humour accompanied the exit of the lens. He recovered speedily and well, and had good sight.

Case ccxiv. M., aged 71. I operated on the right eye, and extracted the lens without much difficulty, although it was not a favourable eye for the purpose. The gentleman who assisted me then operated on the left, and some little difficulty was experienced in completing the section. He went home in three weeks, with the pupil of the right eye clear and circular, and the sight good. The left was obstructed by capsule, and rather contracted.

He returned in six months, in the same state; and I introduced the fine cannula-forceps, and, laying hold of the capsule, I twisted it round and removed it. He went back with excellent sight in both eyes.

Case ccxv. F., aged 48. I operated on the left eye with a needle; and she went on well for about four days, when she went home and was married. Her eye became inflamed and very weak. I operated again, and the pupil became perfectly clear, but her eye was sightless.

About eighteen months afterwards, I made the upper section in the right eye, but with some difficulty, for she was very unsteady; and I was obliged to complete it with the convex knife, and the cataract escaped readily. She was very hysterical, and cried a great deal; but recovered well, and has good sight in this eye now, nearly six years after the operation; and she and her husband still continue to cry whenever I call upon them.

Case ccxvi. F., aged 56. I operated on the right eye, and extracted the cataract. She had subsequent inflammation, but recovered with improved sight and a very contracted pupil. I subsequently enlarged the pupil, and the sight mended.

Case ccxvii. F., aged 39. I extracted the cataract in the left eye by lower section, and she recovered very good sight. She seemed to derive benefit during the cure from the application of the liquor belladonnæ.

Case ccxviii. M., aged 60, a noisy and complaining Hibernian. I extracted his right lens with some difficulty, as he was very unsteady. He went home in about three weeks with a very good sight and a regular pupil.

The next year he came back, having received a blow in his eye which had made the sight dull. I, therefore, operated on his left eye, making the upper section, standing in front of him. A little vitreous humour came out with the lens. He recovered with good sight.

Case ccxix. M., aged 66, with sunken eyes and strongly marked arcus senilis. I extracted the right lens, and he recovered his sight; and came up again in about two months, when I operated on the left eye, and he went home with good sight.

Case ccxx. M., aged 70. I extracted the right lens. He suffered a good deal of pain; but the wound healed, and he went away with improved but not very perfect vision.

Case ccxxi. M., aged 56. I operated in the winter on the right eye; and on the eighth day it was well, and his sight was good. He came back in six months, and I operated on the left, and the eye was tolerably strong and well on the fifth day.

Case ccxxii. F., aged 73. I operated on the right

eye, just shaving the iris slightly. The lens escaped readily, but she said she saw only the light. She was extremely nervous. She made a good recovery, and sees to read and write with this eye to the present day, more than five years after the operation.

CASE CCXXIII. F., aged 60. I operated on the left eye. She recovered well, and now, five years since the operation, sees well.

CASE CCXXIV. F., aged 56, a fidgetty old woman, with cataracts and corneal opacities. I extracted the left lens with some difficulty, and some very fluid vitreous humour followed it. She went on well until the eleventh day, when she could see fairly, and she went home. Inflammation of the eye followed, and when I saw her, nine months afterwards, I found the pupil closed, and a section with the iris knife did not improve her vision.

The next year I operated on the right eye, in which the cornea was most opaque, and made an upper section. When the capsule was broken, the patient jerked out the cataract with a sudden movement, stamping her foot at the same time, and good deal of clear fluid vitreous humour accompanied it. She went home with her eye still weak, but with fair sight. This eye followed the same course as the other, and now (five years after the last operation) she is quite blind.

This can now hardly be called a successful case; but, at the time, both operations succeeded, and subsequent disease destroyed the sight which had been temporarily restored.

CASE CCXXV. F., aged 51. I operated on the left eye in extremely hot weather. She recovered with good sight. About fifteen months afterwards I operated on the right, but the result was a closed pupil. Nine months afterwards I made the usual cut with the iris knife and she saw well at once; but the anterior chamber filled with blood, which remained fluid and red for more than a fortnight. Thinking that fresh blood was being effused, I gave her some turpentine, and it was cleared away in a few days. She had then good sight in both eyes.

CASE CCXXVI. F., aged 72. I operated on the right eye,

making an upper section and enlarging the incision a little with the convex knife as the lens was not disposed to turn out. A little soft matter was removed from the pupil by the curette, and she saw the hands of my watch afterwards. Some inflammation followed, and when I examined her eye the corneal flap was opaque and the pupil drawn up, and it ultimately became closed. I made a section with the iris knife, but she was but little improved. Two years afterwards I extracted the left cataract and she did well, and now (four years since) I hear that she has very good sight.

CASE CCXXVII. M., aged 68. I operated on the right, and he recovered well with good sight.

CASE CCXXVIII. M., aged 71. (This case has been published at greater length in the JOURNAL of May 3rd, 1856.) On making the corneal section in the left eye and trying to extract the cataract, it fell backwards into his eye and remained invisible. He recovered his sight for a time, and as the right eye gradually became more dim, the amount of vision which he retained in the left was more valuable. I afterwards extracted the right cataract, and he recovered well and had good sight.

CASE CCXXIX. F., aged 71. I operated on the left eye, and she did well, and now, five years after, has good sight, but the pupil is a little distorted.

CASE CCXXX. F., aged 63. Upon completing the section in the left eye and rupturing the capsule some vitreous humour escaped, but the lens and capsule were adherent to the upper margin of the pupil, and I could not remove them. The cataract, however, disappeared from the axis of vision, and she recovered and went home with fair sight.

Two years and a half afterwards I saw her again, and I found that her sight had remained good for a while, and after an attack of inflammation she became blind again, and finally struck her eye with the latch of a door and destroyed it. I, therefore, operated on the right eye, and extracted the lens, but with great difficulty, for it was adherent, as in the other eye. She recovered with good sight.

CASE CCXXXI. M., aged 73. I operated on the right

eye, and extracted a large flat and very hard and dark cataract. Some muddy looking fluid escaped from the eye. He had a tedious recovery, and his sight being dim and the eye weak, I gave him some calomel and opium, with a blister on the temple, and under this treatment he mended, and went home with good sight.

Six months afterwards he could see to do all that he required with the right eye, but was anxious for further improvement. I, therefore, extracted the left lens, and he went home with clear corneæ and pupils, and seeing well with both eyes with a four-and-a-half inch glass.

Case ccxxxii. F., aged 72, a very restless little old woman. I operated on her right eye, and extracted the cataract with great difficulty. When the knife entered the cornea at the outer side, she struggled and strained and kicked so that the point passed behind the iris. I withdrew it a little, and completed the section very slowly, the iris bulging out at each side of the knife through the wound in the cornea in consequence of her efforts. As soon as the capsule was ruptured she squeezed out the lens by a sudden contraction of the muscles of the eyeball, and some vitreous humour followed. I sent her to bed with very little hope of success. The next day she had pulled off the bandage and court plaster, and was extremely restless, complaining of the martyrdom of bed. On the fifth day she told me she could see as well as ever she could, and her eye was strong. She went home soon afterwards with good sight.

Case ccxxxiii. M., aged 62. I operated on right eye, and he went home shortly after with excellent sight.

A year afterwards I operated on the left, and he recovered his sight in this eye also, the pupil being a little distorted, in consequence of a blow which he gave it a week after the operation.

Case ccxxxiv. M., aged 56. I operated on the left eye, and he went home in about three weeks with good sight. He came up for a second operation the year afterwards, and did very well, going back to his work with good sight in both eyes.

Case ccxxxv. F., aged 65. I operated on the right eye, in which cataract had existed five years, and re-

moved a flat, hard, and dark amber lens. She described the light as of a violet colour. She went home with excellent sight.

Case ccxxxvi. F., aged 78, a strong, healthy old woman. I operated on both eyes, and she went home with excellent sight in them. I have seen her lately, now four years after the operation, and she sees well with both, being 82 years of age.

Case ccxxxvii. F., aged 47. I operated on the right eye, and she recovered excellent sight.

Case ccxxxviii. M., aged 80, had cataracts in both eyes; but a year before I saw him he struck the right eye with the point of a rake, and thus regained enough sight to enable him to get about his farm and do a little work. This, however, afterwards failed, and the iris became tremulous, and I, therefore, operated on his left eye. He went on well until the ninth day, when I found him walking about with a clear and large pupil and very good sight. The next day his eye was painful and inflamed, and he complained of headache, and a week afterwards he said he could see nothing. When I could examine the eye fairly I found the iris rather green, but the pupil was circular, while the cornea was hazy, and altogether it looked very unpromising. He said that in the night before the inflammation came on he struck his eye, and this explained his state satisfactorily. His sight became much better before he left, and a month after his return home his sight was improving. I heard of him again a year and a half afterwards, and he had then excellent sight, and was able to attend to his farm. The blow on the eye in this case caused effusion of blood into the anterior chamber, and the absorption of it restored his vision.

Case ccxxxix. F., aged 78. I extracted the cataract from the right eye, although she still had useful sight in the left. She recovered well, and has at the present time (four years after the operation) very good sight. The cataract in the left eye appeared, at the time of the operation, to be progressing rapidly, but at the present time it is very little more advanced than it was then.

Case ccxl. M., aged 68. I operated on both eyes,

and he recovered speedily, union taking place in both corneæ by the first intention. He had circular clear pupils and good sight in each.

CASE CCXLI. F., aged 74. I operated on the right eye. It was not a favourable case, the eye being much sunk. She recovered with good sight.

CASE CCXLII. F., aged 65. I operated on the left eye, and she recovered speedily, with excellent sight.

CASE CCXLIII. M., aged 58. I operated on the left eye; he went home shortly with good sight.

CASE CCXLIV. F., aged 81, a very feeble and low spirited old woman, suffering from religious melancholy, with fully formed cataracts, but very sunken eyes. I operated on the right eye, and extracted a hard lens. She complained of obscure pain in the brow during her recovery, and when I could examine the eye I found the pupil closed. Six months afterwards I made a cut with the iris knife, and a small pupil was formed. She always declared that her sight was no better; but she walked about her house without stumbling against a chair or table, and when driving out could see the buildings, for she knew whereabout she was. She was provided with glasses, which she used constantly, always persisting that she was blind. I believe she had fair sight.

CASE CCXLV. F., aged 68. I operated on the left eye, and she recovered speedily and has seen well ever since.

CASE CCXLVI. M., aged 71. I operated on the right eye and extracted the cataract, and he went home in a short time with a weak eye, some prolapsus of the iris, and but little sight.

Nine months afterwards I saw him, and he had a closed pupil, and I therefore incised the iris with the iris knife with the effect of enabling him to see much better for a few days, but as his sight became more dim I removed a portion of iris, and at the fourth and last operation I dislodged a piece of opaque capsule, so that ultimately he went home with good sight.

CASE CCXLVII. M., aged 61. The cataract in his left eye followed a blow sixteen years before his admission, and the right eye had become more recently blind. I

made a lower section in the left eye, but owing to the toughness of the capsule could not break it with the curette. The lens was extracted with much difficulty, and he went home with but little sight, returning in the course of a year with the vision improved but the pupil excessively minute. I touched it across with the iris knife, and a central, black, and tolerably circular pupil suddenly appeared and he saw well.

Case ccxlviii. M., aged 72, had undergone extraction and the formation of artificial pupil on the right eye in London without any success. I operated on the left eye, and he recovered with excellent sight. He had dull pains round his brow during his recovery, and I blistered him freely, and when he was quite well his pupil was small and irregular, and I believe that iritis had been going on, and that seems to have been the disease which had destroyed the sight in the other eye. He sees well to the present day, more than three years after the operation.

Case ccxlix. M., aged 57. The cataract in the left eye was deeply seated, and had been coming on four years. The right eye was blind from closed pupil and old internal inflammation. I operated on the left, and he recovered speedily, but had very imperfect sight, for opaque capsule obstructed the pupil. I tried to remove it with the cannula forceps, but in vain, and two weeks afterwards I broke the capsule across with a needle through the sclerotic, and he went home with a circular pupil and good sight.

Case ccl. M., aged 58. I extracted the lens of the left eye, and he recovered with improved vision, but a portion of opaque matter remained in the pupil; this was removed, and he went home with good sight.

Case ccli. M., aged 59. I operated on the right eye, and made the upper section, and when the capsule had been ruptured a quantity of vitreous humour and small portions of the lens suddenly gushed out. The corneal flap fell down, and the lens itself disappeared from view. I let the patient sit quietly on one side while I operated upon a squint case, and when I examined him again the lens was presenting at the pupil, and was easily removed. A very large quantity of vitreous

humour had escaped. He recovered in a week, and had good sight.

Case ccLII. M., aged 43, with remarkably full and prominent eyes and very thin corneæ. I extracted the right cataract, and he went on well until the fifth day, when he accidentally touched his eye and it ran with water considerably. He recovered well and has still very good sight.

Case ccLIII. M., aged 68. I operated on the left eye by lower section, and a little fluid vitreous humour escaped. He recovered excellent vision, and could see to read well, but the pupil was slightly drawn down. The next year he came down again, and I operated on the right eye by an upper section, and he recovered excellent sight with this also.

Case ccLIV. M., aged 45. I operated on the right eye without accident, and he received very good sight.

Case ccLV. M., aged 60. I operated on the left eye, removing some *débris* from the pupil after the lens had escaped. He had an attack of iritis on the ninth day, which was treated with blisters, and calomel and opium, and he went home, after five weeks confinement, with good sight. His sight cleared as he became affected by the mercury.

Case ccLVI. F., aged 76. I operated on the left eye, and immediately afterwards Mr. Leonard operated on the right, and she recovered excellent sight.

Case ccLVII. F., aged 57. I operated on the right eye. The corneal flap was rather disposed to fall down. She recovered with fair sight.

Case ccLVIII. F., aged 65. I extracted the cataract from the right eye, and it was followed by a little clear vitreous humour. She went on well, and, after a tedious convalescence, recovered her sight.

Case ccLIX. M., aged 86 last birthday, lost his sight in his left eye a few years before from a blow, and cataract had gradually formed in the other. This was an extraordinary old man, who had lived as a hermit all his life, studying botany, astronomy, and mathematics; and he was so suspicious of mankind that no one was allowed to enter his house. He cooked his own food, even when he was

blind and 85 years old, and when he was able to walk about he carried his purchases home in his umbrella. He probably knows more of optics, astronomy, and mathematics, than any one in this neighbourhood, and the loss of his only eye was, perhaps, even more distressing than to most. He had a little sunken eye and very prominent eyebrows, and it was a very unpromising case, but the helpless condition of the old man induced me to give him a trial. I extracted the cataract in the right eye, and he recovered his sight, and now (nearly three years after the operation) he can see to walk about everywhere and to read a little. Since the restoration of his sight he has also improved wonderfully in his health, and can walk some miles and attend to his own affairs.

Case cclx. M., aged 56. I operated on the left eye, making the lower section. He recovered speedily, and sees to read and write now without difficulty.

Case cclxi. M., aged 63. I operated on the left eye, and extracted a large flat amber lens. On the seventh day his eye was strong and he had excellent sight.

Case cclxii. M., aged 55. I operated on the right eye, and extracted the cataract through a small upper section. Débris of the lens had to be removed from the pupil. Inflammation apparently brought on by cold and diarrhœa followed, and he went home with closed pupil.

Nearly two years afterwards I made a cut in his iris with the iris knife, but it was insufficient; and, therefore, after waiting a few days, I operated again, making a section in the cornea, and drawing out some of the iris with a hook, and then I introduced the cannula forceps and drew out a piece of capsule. He went home with very good sight, with a four inch lens.

Case cclxiii. F., aged 56. I operated on the right eye by the upper section. She made a good recovery from the operation, but some opaque matter filled the pupil and interfered with vision, and thinking it was capsule I introduced a needle to depress it, but it turned out to be quite soft. After stirring it about it was soon

absorbed, and she recovered with excellent sight, and is now able to see to read and write. The cataracts in this case were recent.

CASE CCLXIV. F., aged 76, an active little old woman. I extracted first the left and then the right cataract. In making the corneal section in the right eye the globe rolled inwards, and the point of the knife caught the conjunctiva and the aqueous humour rushed out of the anterior chamber into the cellular tissue between the conjunctiva and sclerotic, and a complete chemosis was suddenly produced. She recovered with excellent sight with both eyes in a very few days.

CASE CCLXV. F., aged 73. I made the lower section in the left eye and completed it with a little difficulty, owing to pressure made by the finger of my assistant. She was a stout woman, subject to headache. I applied belladonna to the brow, and gave her several doses of cathartic mixture, and she recovered and has very good sight.

CASE CCXLVI. F., aged 73. I extracted both cataracts without difficulty, and within a week she opened both her eyes, and saw well, and in a few days went home with excellent and strong sight.

CASE CCLXVII. M., aged 52. The cataract in the right eye was irregularly opaque. I extracted it, and it came out enveloped in the capsule, which had the opaque spot upon its upper part. Some vitreous humour flowed out also. His eye was much inflamed for some time, but he ultimately recovered. I have not recorded the exact condition of his sight.

CASE CCLXVIII. M., aged 45. I operated on the right eye. Some soft flocculent matter remained in the pupil after the escape of the lens, and this I removed with the curette. He recovered well and has excellent sight. On examining his eye it would not be possible to say that anything had been done to it.

CASE CCLXIX. F., aged 46. I operated on the right eye. After making the corneal section and rupturing the capsule the lens escaped in two distinct portions, and there was a free flow of vitreous humour, so that the eye

looked quite collapsed. She recovered in about ten days with good sight.

CASE CCLXX. F., aged 44. I had operated upon this patient's left eye with a needle a year before the date of the extraction of the cataract in the right, breaking up the anterior capsule and surface of the lens with the needle, and on an after occasion I depressed a portion of capsule, and at a third operation I removed some of it with the cannula-forceps, and after all she recovered very good sight. I extracted the cataract from the right eye, and she recovered speedily, and she now has excellent sight in both eyes, being able to read and write and sew well.

CASE CCLXXI. M., aged 72, had only one eye (the right), and from this I extracted the cataract by an upper section. After the lens had emerged from the pupil some flocculent matter remained. This was removed with the curette, and the pupil became black and clear. He recovered speedily, and had good sight.

CASE CCLXXII. F., aged 60. I extracted the right lens by the upper section, and a little vitreous humour escaped at the same time. She did well.

CASE CCLXXIII. M., aged 55. His left eye had been operated on by Mr. Estlin many years ago with the needle, and with but poor success. The right very gradually became dim, and the amount of blindness scarcely corresponded to the slight amount of dulness of the lens. I extracted the cataract from this eye, and at a subsequent occasion I removed some opaque capsule with the cannula-forceps. He recovered sight enough to walk about alone, and by looking through a small slit in a card he could see fairly.

CASE CCLXXIV. F., aged 77. I operated on the right eye and cut through a very marked arcus senilis. She went on well for a time, but some inflammation ensued, and the cornea became opaque above where the incision was, and the pupil was drawn up. I divided the iris with the iris knife, and in a few days after the blood effused in the anterior chamber had been absorbed she began to see better, and she could distinguish the things in her room and see to get about.

The next series of eye-operations which I have to bring forward includes the cases in which the patients did not recover their sight after the operation of extraction of cataract. They are fortunately not so numerous, but are probably more instructive, although less satisfactory than the series just completed. I shall first enumerate eight in which the operation itself succeeded in removing the cataract satisfactorily, but where an amaurotic condition of the eye prevented the patient from seeing.

Case cclxxv. F., aged 50, with little or no sight; both lenses yellow, and the iris adherent to the capsule in each eye. It was a very unpromising case, but as she was sent up a considerable distance from the country, and was very anxious for a trial to be made, I operated on the left eye, making a lower corneal section, removing a portion of the iris and extracting an opaque lens through the aperture. She recovered with a clear pupil, but no improvement in the sight.

Case cclxxvi. M., aged 48. His left eye was destroyed twenty years ago by an accident. The right had failed for three years, and was oscillating, with a closed pupil. I extracted the lens through an upper corneal section after breaking up the capsule and interior adhesions, but to no purpose His eye recovered and he went home with a clear pupil, but no sight.

Case cclxxvii. M., aged 54. Cataracts with slight external strabismus. I extracted the left lens by a lower section, and by the sixth day the wound had healed, and he had a clear black pupil, but there was no improvement in his sight.

Case cclxxviii. M., aged 60. His right eye had been staphylomatous for five years; and the left had been almost useless for six months, from an amaurotic condition with cataract. I extracted the cataract from the left eye, and when he recovered he had a clear pupil, but the amount of sight in this eye was useless.

Case cclxxix. F., aged 50, came from more than a hundred miles distance for relief. She had cataract with a pupil blocked up by lymph and adherent to the capsule, in the left eye, and the right had been amau-

rotic for three years. She saw barely the light. I operated on the left eye, unpromising as it was, and extracted a small hard opaque lens, the escape of which was followed by the discharge of some very fluid vitreous humour. The eye recovered after a short time, but the sight did not improve.

Case cclxxx. M., aged 61, with deep seated yellowish opacity, scarcely sufficient to account for his dimness of vision. I extracted a very yellow and slightly opaque lens from his right eye by an upper section. The operation was followed by a considerable amount of inflammation which was eventually subdued, but he never recovered his sight.

Case cclxxxi. M., aged 56. I extracted a dark and hard lens from his left eye with some little difficulty, owing to the extreme fluidity of the vitreous humour. His eye recovered fairly, but his sight was gone.

Case cclxxxii. F., aged 54, apparently a good case for operation, both eyes having been affected three years. I removed both cataracts; in tho case of the right eye, the lens escaped with a good deal of vitreous humour; but in the left, the capsule was left behind, opaque and blocking up the pupil. I removed it with a hook, and it came out entire. After the operation she saw light with the right eye, but not with the left. The same night she complained of much headache, aud I bled her and she was at ouce relieved. Both corneæ healed, and her eyes looked well, but she had uo sight, for they were amaurotic.

Of the following two cases, one has been published in the Journal for May 3rd, 1856, and in both of them the sight was destroyed by the rare accident of hemorrhage after the operation.

Case cclxxxiii. M., aged 60, with cataract of the right eye and corneitis; cataract and adherent pupil in the left following an injury. I operated on the right and extracted the lens. His eye never quite recovered, but becamo staphylomatous. I then, after waiting six months, operated on the left and removed the opaque lens. Hemorrhage came on in the night, and filled his eye, so that it looked liko a melanotic tumour, and it completoly destroyed the sight.

Case cclxxxiv. M., aged 73. I extracted tho cataract from tho right eyo; the left had been destroyed ten years before by an accident. Ho went on well until the fifth day, when his eye began to bleed in tho morning, as he was coughing, and a clot formed within the globe and his only chance of sight was thus removed.

Tho third set of unsuccessful cases was from suppuration in the eyo, and in almost all of them the patients were weakly persons in broken down health.

Case cclxxxv. M., aged 56, had lost the sight of the left eye from a blow which produced amaurosis and capsular opacity; and his right eye had failed for eighteen months before I saw him, and in this eye there were cataract and adherent pupil, and the globe was soft. The prospect was most unsatisfactory, but at his request I operated, and with some difficulty removed the lens and capsule, and he saw the light better afterwards. On the third day his eye was very weak and painful, and the next day the lids were swollen with puriform discharge and the eye suppurated, as if it had been affected with purulent ophthalmia.

Case cclxxxvi. F., aged 58, a weakly woman, very nervous and restless. I extracted the left cataract without material difficulty, and the same evening she complained of great pain, and the next day vomiting commenced, and the eye began to discharge. The eyeball suppurated and sank. This patient has since that date (1853) been content with the application of belladonna to the other eye, but will not submit to further operation.

Case cclxxxvii. M., aged 73, a large and blustering man, very unwilling to submit to discipline and reasonable directions (although by profession a preacher to others). I operated on the right eye and extracted the cataract without difficulty, a little vitreous humour escaping with the lens. He saw fairly after the operation, but the next day pain and swelling of the lids had begun, and his eye shortly suppurated. He went home without sight.

I believe that in this case the flap of the cornea came down in the night, for the patient was very restless.

Case cclxxxviii. M., aged 64. I extracted the

right lens most satisfactorily, and he saw very well and "blue" afterwards. On the third day his eye was painful and the lids swollen, and suppuration set in and destroyed his eye.

Case cclxxxix. F., aged 70, with sunken eyes, but otherwise a good case. I experienced very great difficulty in making the corneal section in the right eye, and when it was completed the lens fell back into the eye and disappeared from view. Inflammation came on on the third day, and the globe suppurated.

Case ccxc. M., aged 71. I extracted the right lens by an upper section; it was dark amber in colour. His sight was fair afterwards. The next day pain came on, and the eye suppurated.

Case ccxci. F., aged 64. I extracted the left cataract by a lower section. She saw fairly afterwards. The next day pain began, and on the third day there was some puriform discharge, and the eye suppurated.

This patient was extremely restless, and had been out of health for some time before the operation.

Case ccxcii. M., aged 65. His right eye had been blind for forty years in consequence of a blow, and ten years before he became my patient he had what appeared to be an amaurotic condition. I operated first upon the right eye by an upper section; and, after rupturing the capsule, the lens was jerked out *into his hand* with some fluid vitreous humour. I then operated on the left eye, making the lower section: the lens appearing to be falling back into the posterior chamber, I hooked it out with the curette. Pain in the eyes came on the same day, and on the following day purulent discharge flowed from the left eye. This gradually increased, and both eyes suppurated, and he went home very ill.

Case ccxciii. F., aged 71, a feeble and rheumatic old woman. I operated on both eyes, and extracted the lenses easily. The next day there was a little purulent discharge, which gradually increased, and after a few days profuse suppuration in both eyes followed.

The following seven patients lost their sight from iritis and closed pupil.

Case ccxciv. M., aged 60. I operated on the left

eyo by a lower section, and extracted the cataract satisfactorily. On the third day he complained of pain in tho head, which loft him after a few hours. He wont on without any active symptoms, but not satisfactorily; and, at the end, when the eye became strong, the pupil was closed. I made a cut into it somo months afterwards with the iris-knife, and he saw more light, but he never recovered useful sight with this eye.

Case ccxcv. M., aged 64, a healthy looking man with fully formed cataracts. Tho only sign of other disease about the eye, which I noticed, was a slight tremulous motion of the iris immediately before I made the section, and when it was completed the lens appeared loose in his eye, and escaped with some very fluid vitreous humour. He went on well until the sixth day, when I found him down stairs without leave, his eye tolerably strong, and with fair sight. The next day inflammation came on, with pain in the eye and head, redness and chemosis, and obvious symptoms of iritis. He was treated actively; but, when the inflammation subsided, he had closed pupil and no sight.

Case ccxcvi. F., aged 65. I operated on the right eye and extracted the cataract, a little vitreous humour following at the same time. She went on badly, suffering much pain and inconvenience, and at last the case terminated by her having a closed pupil.

Case ccxcvii. F., aged 63. I had operated successfully on this patient's sister, who was a spare healthy person, while she herself was a very stout, large, and plethorie woman, with remarkably prominent eyes and corneæ. I operated on the left, in which was a little external strabismus, and extracted the cataract with unusual difficulty, owing to the patient's unsteadiness. Some vitreous humour escaped. She complained much of pain, and on the third day the lids had become œdematous. She had an extremely tedious convalescence, being unwilling to move away from her lodgings; but she never regained her sight, and now, after an interval of five years, she is blind, having on the other side an excellent eye for extraction, but she is not willing to suffer the pain. The pupil of the left eye is closed.

CASE CCXCVIII. F., aged 67. I operated on the left eye and removed a large flat amber lens, leaving flocculent matter in the pupil. On the fourth day she complained of pain in the bone round her eye. The inflammation that came on appeared very slight, but when she recovered her pupil was closed, and she would not submit to any further operation.

CASE CCXCIX. F., aged 56. I operated on the right eye. She went on well for a while, and everything appeared promising. After a fortnight she had sudden pain in the eye, and upon examination the anterior chamber was found to be full of blood, although it had been seen to be clear a few days before. The blood being absorbed, the pupil was found to be closed. I made a section with the iris-knife, and for two days she had good sight, but then the anterior chamber filled again with blood, and she did not recover her sight satisfactorily after it had been absorbed.*

CASE CCC. F., aged 78. I operated on the left eye; both being much sunk. She recovered the strength of her eye, but the pupil was closed and the sight gone.

REMARKS. I hope that the readers of the JOURNAL will not have found these cases very tedious; for they vary a good deal from one another in progress and treatment as well as in their results.

I usually operate with the patient sitting, with the head supported, and make the upper section in the right eye, and the lower in the left eye; although in many instances I have made the upper section in both, and I cannot say which is the best. The eye is covered very lightly afterwards, some little difference being made in this respect with reference to the temperature of the weather. I have not found that it makes much difference in the result in what season of the year the operation is performed. There seems to be no limit as to age; my cases of extraction are all between forty-four and eighty-six, but the greater number between sixty and seventy-five; and the old ones do as well as the others. I do not like to operate in recent cases, for the

* I have recently seen this patient again, and she has very fair sight, and a black and clear central pupil.

lens is then swollen, and some of the softer part is held back by the pupil, and requires to be removed lest inflammation be set up by it. As an instance of advanced age, I may mention a case which I saw during my apprenticeship. Being in lodgings on the coast of Glamorganshire one summer, Mr. Estlin directed me to find out what had been the result of a cataract case on which he had operated many years before; and, after a search, I found an old Welsh farmer, upon whose eye Mr. Estlin had operated eleven years before. At the time of the operation he was *eighty-eight* years old; and when I saw him, he was sitting in his arm-chair and in his farmyard, in his *hundredth year*, and he had been able to see well ever since the operation.

I have never given chloroform for this operation; for the pain is very slight, and I should fear the effect of the sickness which chloroform sometimes produces, and in old people particularly chloroform is never absolutely safe; and there is to me one other objection to the patient's being insensible during this operation. I think it is a great gain to him to see immediately afterwards, for it gives him encouragement to be quiet in his bed for a day or two with greater hope as to the result of his case, and this is not so trivial a matter as it appears. I am, however, aware that the opinion of some surgeons more experienced than myself is in favour of chloroform.

We so often see a white looking cataract contain a hard amber nucleus, that I do not think any one can say whether a cataract is hard or soft; and I believe that all cases in adults are likely to do better by extraction than by the needle-operation.

I do not generally notice any difference in the healing of the incision when it passes through an arcus senilis. It is an usual rule not to operate on one eye while the patient can see fairly with the other, and to choose the eye that has been longest affected and most dim; and I believe that this rule is most to the patient's advantage and the surgeon's credit.*

* The wisdom of this advice, in a worldly point of view, is quite another question, and many distinguished ophthalmic surgeons

As to the question whether both eyes should be operated on at the same time or only one, I am still of the opinion I expressed before; viz., that a patient has a better chance of recovering sight when both are operated on, than when *one only* is operated on, and that the best chance is when one is operated on, and the other at a suitable interval. In fact, the question is resolved into one of convenience, and the opportunity the patient may have of obtaining surgical aid; and I have hitherto acted on this opinion and have seen no reason to regret it.

Another point has been mooted, which is worthy of consideration; viz., whether the successful removal of one cataract has the effect of retarding the formation of the cataract in the other eye; and upon this point I have no experience to offer. The only case which touches on the question was No. 237; and a single case is of no service in settling a question of this kind.

It is always a favourable sign of a healthy retina if the patient sees blue, violet, or purple light on the completion of the operation; and the fact is obviously explained by the yellow or amber colour of most cataracts; the blue tint which is seen being the complementary colour to the yellow or reddish light seen through the diseased lens.

In the after-treatment, but little is required if the case go on well; and if inflammation threaten, now that bleeding is gone out of fashion, our most valuable remedy is taken away. The application of the blistering fluid to the temples has in some cases saved the eye; and it is often of service to paint the eyelids and brows with the liquor belladonnæ, for the pupil is kept open in this way and the pain is lulled. Opium and blue pill may also be given.

When the case is to end badly by suppuration, the disease sets in on the second or third day; but when the

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differ practically from me in this point; at any rate, I have frequently recommended delay, when consulted by patients (not poor ones) who could see fairly with one eye, and the result has generally been that they have gone to London for a "further" opinion, and have been forthwith operated on.

sight is destroyed by iritis, it is often on the sixth or eighth day that the inflammation begins.

The following cases frequently do badly: where one eye has been injured, or where the iris (or lens) is tremulous, or where there is any iritic adhesion, or sign of previous internal inflammation, or amaurosis, or roughness of the cornea, tendency to conjunctival inflammation, or much disposition to gout or rheumatism; and a surgeon who is determined to shew first-rate statistics, by excluding all these cases, may select some that would give almost universal success. There is, however, another view of the question; for, unless we can say that the patient cannot possibly derive any advantage from the operation, it is hard to refuse him the chance. Here, for instance, we get many poor and blind persons who have travelled up from South Wales or the neighbouring English counties, and who beg for the trial of an operation; and if it prove unsuccessful, as a reference to the foregoing cases will show that it not unfrequently does, they go home more resigned and satisfied.

Were I to subtract from my list of unsuccessful cases all those which would be rejected as unfavourable by a strictly scientific surgeon who would lend no ear to the prayers of the bad cases, it would leave but a small number in which the operation of itself had failed.

Needle Operations for Cataract. My needle cases are not nearly so numerous as the others. I have divided them into congenital and acquired, and will begin with the description of the former, as briefly as possible.

Case ccci. F., aged 11 months. The right eye had been operated upon before, and with success; I depressed the capsule and lens, and the eye became clear. The capsule partially reappeared in the sphere of vision, but the eye improved and lost its unsteadiness.

Case cccii. F., aged 9 months. I broke up both lens through the sclerotic. At a second operation the capsule which had become opaque was depressed. She got on well for some years, and when I saw her again there was some little capsule in the pupils. This I removed by the small pointed cannula forceps, first from

the right eye, and subsequently from the left. She has been able to see fairly, but there is an imperfection in her vision so that she cannot see to read.

CASE CCCIII. M., aged 17, a dull boy, whose parents had allowed him to grope about in blindness for this number of years, within five miles of Bristol, and in a village whence patients continually come in for advice and treatment in their eye-complaints. He had besides a cleft palate. I operated on both eyes with a needle posteriorly, and broke them up freely. He had vomiting at night. After the first day he went on well, and the pupils cleared, and he went home and was able to see to work in the fields.

I published this case in the JOURNAL many years ago, and will now only add that it demonstrated many of the interesting phenomena of the correlation of sight and touch most satisfactorily.

CASE CCCIV. M. aged 8 months. I broke up both lenses completely, by needle through the posterior chambers, and in a week the left eye was clear, and the right almost so, and he was taken home with good sight.

CASE CCCV. F. aged 7 months. Both cataracts were well stirred up through the sclerotic, and after a short time the child apparently saw well, although some capsule remained in each pupil.

CASE CCCVI. M. aged 8. I operated on both eyes, and broke up the cataracts. He was excessively boisterous and noisy, and afterwards so sulky that I could only judge of him *objectively*. His eye became tolerably clear and he appeared to see better. He had an attack of inflammation in the cornea a few days after the operation.

CASE CCCVII. F. aged 18. She could just see enough to walk alone, but not to work. I operated on the right eye first and depressed the lens and capsule. She went on well, and had a clear pupil and good sight; *i.e.* she could see the figures on my watch without a lens. I afterwards operated in the same way on the other eye, with like success.

CASE CCCVIII. M. aged 13 months. The mother says that at birth the child's eyes were natural, and that it

could see then. I broke up both the lenses, and they became partially absorbed. An operation was subsequently performed on each eye to remove some capsule, and he now sees well.

Case cccix. F. aged 7 weeks. This was a case of great interest. The mother, a sensible woman, the wife of a man who kept a little shop, brought to me a child about 2 months old, to ask what was to be done for the eyes. I told her that a slight operation was necessary, and she went away. In a few weeks (or less) I heard that the child was dead, and I made a *post mortem* examination, and could only conclude that it had died of starvation. The mother was so distressed by my telling her that the child must undergo an operation that her breasts ceased to secrete and the child died. The next child that was born had good eyes, and this was followed by the subject of this account, a child with cataracts. I operated and broke up both the cataracts satisfactorily, and the case promised very well. About a fortnight afterwards I called, and found it was dead. It had died in its mother's arms in the night, and had evidently been accidentally suffocated. I made a *post mortem* examination. After this the woman had another seeing child, and then again one born with cataracts, which was brought to me: I advised an operation, but I never saw it again.

Case cccx. F. aged 9 months. I operated on both eyes and broke up the lenses which were glistening and brittle; and fine splinters, almost like pieces of crystal, flew off into the anterior chamber. The lenses were absorbed, and the case did well. The child sees fairly now.

Case cccxi. F., aged 33, had cataracts from childhood, but they were not very opaque, and she could see to do ordinary household work. I operated on the left eye which was least useful to her, and broke up the lens through the posterior chamber. She suffered considerable pain for two days, but afterwards she recovered well and her sight was much improved.

Case cccxii. M., aged 25, had been partially blind from birth, but he had been able to see to work as a

miner, an employment well suited to such cases, and his sight had been getting much more impaired. I broke up the left lens which was absorbed and his sight much improved. On a subsequent occasion, he came up to Bristol, and I operated on the right in the same way; he went home with good sight.

Case cccxiii. F. aged 9 months. The mother said that the child had good sight for two months. I broke up both lenses freely from behind, and the case did perfectly well.

Case cccxiv. F. aged 9 months. A similar case to the last. No symptoms followed the operation, and the child recovered well.

Case cccxv. F. aged 4 months. I operated on the right eye and broke up an opaque capsule, and on the left, in which was a more dense cataract, and where a white nucleus slipped into the anterior chamber and remained there. No inflammation of any kind followed and the case did well.

Case cccxvi. F. aged 4 months, I operated on the right eye and broke up the lens, and Mr. Leonard, who assisted me, did the same with the left eye. The child cried but little, and was going on perfectly well when it was taken home into the country, many miles away from Bristol.

Case cccxvii. M. aged 4 months. An exactly similar case to the last in every respect.

Case cccxviii. F. aged 8. I had seen this patient some years before, and she had at that time merely a central capsular cataract, as it is called, but a fair amount of sight, and I advised no treatment. Afterwards the lenses became dull and the child was blind, the central spot being still very visible. I broke up the left (the worst) cataract from behind, and although I did it freely and the lens was comminuted the white spot remained *and the needle seemed to pass through it as in a shadow.* It was apparently a reflection from the deeper structures of the eye. The patient did very well, and has good sight with this eye.

In the following two cases the operation did not succeed.

Case cccxix. M., a pupil at the blind asylum, who had large wide pupils, bright irides, and dense white capsules. He saw the light. I removed the capsules with a needle; but he saw no better, being amaurotic.

Case cccxx. M., aged 15 months, a weakly child with opaque capsules and small adherent pupils. I operated with a needle on both eyes, depressing the capsule. The child had been ill and was cutting its teeth, the gums being in a state of suppuration. It died on the fifth day after the operation.

Case cccxxi. M., aged 29, a miner, who had always had cataracts, but could see to work. I operated upon one eye, with the needle, and broke up the cataract, until it seemed tolerably equally diffused through his aqueous humour. He complained much at first that his sight was worse than before the operation, but it afterwards cleared, and ultimately this eye was the best.

Thus, with the exception of the amaurotic boy from the blind asylum, and the unhealthy child which died, all my cases of operation for congenital cataract were successful.

The next series, of about forty cataract cases, contains those where the disease was not congenital, and a needle operation was performed.

Case cccxxii. M. aged 26, had undergone an operation on the right eye for cataract before I saw him, and he wished to be cured in the left eye also, in which he had had a cataract eleven years. I operated on the left eye and he was speedily cured, and saw to work well with it.

Case cccxxiii. M., aged about 25, the brother of the last case, who had had cataract in the right eye for thirteen years, and in the left a year. I broke up the cataract in the right, and he obtained excellent sight. About three years afterwards, I operated on the left eye; and when he left Bristol, his sight was improving, but was far from good in this eye, being excellent in the other. I have no further report of him.

Case cccxxiv. F., aged 28, blind in the right eye with adherent capsule and iris with opacity of the lens; in the left eye there is opaque capsule. I removed this by

means of a corneal section and the cannula-forceps, and left a bright black pupil. She saw well at once, and it remained well, and she went home to be married.

Case cccxxv. F., aged 19, with cataracts of six months standing. I operated on the right eye with a curved needle through the cornea, breaking up the anterior capsule, and in the left eye I broke up the lens with the same needle through the sclerotic. He had more pain in the left than the right, but absorption went on favourably in both, and she was cured.

cccxxvi. M., aged 35. The left eye was defective in sight, and had formerly been operated on for strabismus. The right eye was injured by a piece of iron or rust some months before I saw him, and it gradually became more dim; and when the cataract was fully formed, a brown spot was visible on the capsule. I operated, and opened the capsule through the cornea, and touched the brown spot, which disappeared suddenly, and was, I have no doubt, a bit of iron adherent to the lens. Nothing more was seen of it, and he recovered, with excellent sight.

Case cccxxvii. M., aged 30, with dim vision coming on for nine years. I operated on the left eye through the cornea, and the lens became more opaque, and was afterwards absorbed, but not for some weeks. In the mean time, during my absence, a friend operated on the right eye, and the lens was absorbed, but opaque capsule occupied the pupil. This I removed with the cannula-forceps, and he obtained excellent sight in each eye.

Case cccxxviii. F., aged 21, with cataract in both eyes, of three months standing. I operated on the right eye with the short needle, known as Jacob's, and broke up the lens by a drilling motion, without disturbing it from its position; then, with an ordinary straight needle, I broke up the left cataract from behind. On the sixth day, she could see fairly with both eyes, and looked about a good deal; and on the seventh, inflammation and headache came on. This increased considerably for two days; and I gave her compound calomel pills, belladonna was applied to the eyes, and blisters to the

temple. Under this treatment, she recovered completely; and I saw her many months afterwards with excellent sight in both eyes.

CASE CCCXXIX. M., aged 25, with fully formed cataracts in both eyes. I operated on the right with a curved needle through the cornea, and the left lens I depressed from behind. Considerable inflammation followed. He recovered with good sight; the left eye being better than the right.

CASE CCCXXX. M., aged 4½. He was a weak diminutive child, who had just learnt to walk; and the lenses had become opaque shortly before I saw him. I broke up both lenses from behind; and the child, who cried but little, and did not appear to feel much of the operation, evidently saw better afterwards. He went on well; and when I saw him, some months later, he had a central clear pupil and fair sight.

CASE CCCXXXI. M., aged 22. He had internal strabismus and cataract of the right eye, following an injury. I divided the inner rectus, and then broke up a thin biscuit-like lens with a needle through the sclerotic. A good deal of inflammation followed, and it was necessary to blister him and give mercury; under which treatment the bad symptoms subsided; and he went home with his pupil getting much clearer.

CASE CCCXXXII. M., aged 47, with well formed cataracts in both eyes, coming on gradually at first, but subsequently very rapidly; for he said that he could see to work at his calling (harness-making) four days before I saw him, and then he could not see to walk alone. I operated on the right eye (the most recent cataract) with a needle through the cornea, and partially broke up the anterior capsule, but the left was more efficiently done. After a few days, some inflammation came on, for which I treated him with belladonna, mercury, and blisters, and he improved and went home, but returned in three months, suffering pain. The left eye was tolerably clear, and he had fair sight; the right was inflamed from the pressure forward of the nucleus of the lens. I made a lower section, and removed the lens easily; but the operation was very painful, owing to the

inflamed state of the eye. He went away with a large clear pupil and excellent sight.

Case cccxxxiii. M. aged 40. The cataract in the right eye had been successfully removed by a colleague, but the sight was imperfect. I operated on the left breaking up the anterior capsule, and a quantity of opaque fluid flowed into the anterior chamber. I subsequently depressed a portion of the nucleus that remained, and he did very well.

Case cccxxxiv. M. aged 30, with cataract in the left eye, the result of gonorrhœal ophthalmia. He was very anxious to have the deformity removed, and I therefore broke up the lens.

Case cccxxxv. F., aged 16, with fully formed cataracts of a year's standing. I operated on both eyes with a straight needle through the posterior chamber. She had vomiting afterwards, but subsequently she went on well, and had very good sight. She was apparently much improved in intelligence soon after the sight was restored.

Case cccxxxvi. M. aged 50. Both eyes had been operated on some years before I saw him, by a surgeon in the country, and the right had suppurated, while the pupil of the left was partially obstructed. I broke up the lens again through the sclerotic, and he recovered after a short time with very good sight, able to read with a suitable glass.

Case cccxxxvii. F., aged 20, with single cataract and adherent iris of the right eye. I tried to depress the capsule, for such it proved to be, as sho was anxious to be rid of the deformity, but the point of adhesion seemed to hold it. The next day the opacity was as before, but her anterior chamber was discoloured, being of a green hue, and a few small vessels were to be seen ramifying in the capsule from the adherent point; the sclerotic vessels were full. On a subsequent occasion I made a section in the cornea and with the cannula-forceps drew out the opaque capsule, leaving a clear pupil and fair sight.

A point of interest in this case is the discoloration of the anterior chamber, due to a slight effusion of blood

from my dragging upon the adherent iris during the operation. A blow upon a healthy eye, a minute puncture will not unfrequently produce the same result, and the effusion of blood under the conjunctiva following the rupture of a small vessel during the strain of coughing or sneezing sometimes encroaches under the conjunctival layer of the cornea and gives rise to exactly the same appearance. A case of the latter kind is mentioned in Mr. Lawrence's work on *Disease of the Eyes* (p. 138), where the cause of discoloration was not discovered, although the patient had considerable effusion under the rest of the conjunctiva, and where he was subjected to cupping and mercurial treatment, when time alone was sufficient for the cure.

Case cccxxxviii. M., aged 26, with cataract of five years' standing, from an injury with an awl. He was anxious for an operation to get rid of the deformity. I therefore operated with a needle and broke up the lens and capsule. He complained of great pain, and was rather hysterical. The case did perfectly well.

Case cccxxxix. M. aged 11. A boy with very imperfect organs of vision, one having sloughed from purulent ophthalmia at birth, and the other being much damaged by adherent pupil, and opacity of the lens. I operated on the latter (the left) with a needle through the sclerotic. He was very sick afterwards, but went on well, and his sight was much improved.

Case cccxl. F. aged 37. This case was similar to the last. The right eye was flat and sightless. The left cornea was opaque below, and above was a large artificial pupil (made by the late Mr. Scott) blocked up by a cataract. I broke up the lens with a needle, and after the usual accompaniment of twenty-four hours' sickness, she did very well.

Case cccxli. M., aged 30, with cataract of the left eye, very opaque and white, and incipient cataract of the right. I operated on the left, through the cornea, and numerous flocculi fell forward into the anterior chamber. About a month afterwards I touched it again, and he went home with fair sight, there being a central clear hole. Two years after this he came up again, to try to

get his sight improved, as he was now quite blind in the right eye. He was extremely weak and thin, and appeared phthisical. I removed the capsule of the left eye with the cannula-forceps through a small corneal section with great ease, and I then depressed and partially broke up the right lens. The case went on very badly; vomiting and great pain followed the operation, and his left eye suppurated entirely. The remedy that relieved him most, was quinine. He went home after a time, and the sight in the right eye was gradually getting better.

Case cccxlii. F., aged 16, with cataract in the left eye only. She was anxious to be cured of the deformity. I operated and broke up the lens completely, and some portions started forward into the anterior chamber. In seven weeks the whole of the opaque part was absorbed, and she had fair sight.

Case cccxliii. M. aged 25; unable to work in consequence of dulness in the left eye and capsular cataract in the right. I depressed and broke up the latter, and his pupil soon became quite clear. The sight in the left eye, which seemed to be very clearly in an amaurotic state, became much better by use.

Case cccxliv. M., aged 30, had met with accidents (at separate times) in both eyes; the left was punctured with a pen and the cornea became partly opaque and prominent with adherent capsule. The right had also had cataract which had been cured; but at a subsequent time a blow had destroyed his sight again. I operated on the left eye, his now only remaining chance, and broke across some of the adhesions of the capsule, and depressed it: his sight was much improved.

Case cccxlv. M., aged 49, had cataracts and prominent and opaque corneæ. He could see (as is usually the case) better in the dusk or on a dull day, but could not see close objects. I depressed the right lens, and after a time it was dissolved, and his sight was much improved.

Case cccxlvi. M., aged 56, with capsular opacity in the left eye, adherent pupil, opaque cornea, and tremulous cataract in the right. I operated first upon the

right, and depressed tho cataract. In the left I tried to removo the capsulo but could not do so. His sight in the right became very good, but the left lens, in its turn, becamo tremulous, and I reclined it after a time, and ho recovered very good sight. He could tell the time by the church clock without a glass, and with a four-inch lens sees near objects clearly.

Case cccxlvii. F. aged 52. Double cataract. I extracted the left by lower section. She was a very nervous old woman with prominent brows and sunken eyes. The operation was performed with some little difficulty, and a very dark lens removed. She went on perfectly well for a while, but inflammation came on, and she went home with a closed pupil. I, at a subsequent period, reclined the lens in the left eye, and she saw well for about twelve days, when after a severe fit of coughing she found herself blind again, but in two days the cataract fell again out of the way, and she went home with good sight.

Case cccxlviii. F. aged 27. Left eye sunk; right eye had corneal opacity, following small pox, and also cataract which had existed since she was three years old. She saw merely the light, but was very intelligent. I have published this case at length in the Journal. The patient recovered her sight at once, and all the phenomena connected with the process of learning to see and to recognise by sight what she perfectly well knew by touch, were most marked and interesting.

The few remaining cases of needle operation were either unsuccessful, or no strict record was kept of the result.

Case cccxlix. M., aged 60, with amaurosis of the left eye, and cataract with adhesion of the pupil in the right. He saw the light with both. I depressed the cataract in the right and he recovered considerable sight in it, and the left mended, on the restoration of vision to the other eye. After three months I operated again, and removed the capsule which still obstructed vision a little: inflammation followed, which was overcome by leeches and other appropriate treatment, but he had no sight in the eye, and he went home well satisfied

with the improved vision of the originally amaurotic eye.

Case cccl. F., aged 38, with double cataract. I depressed the right lens, and she had good sight until the eighth day, when the lens re-ascended and the eye became inflamed; leeches, belladonna, and opium were used. I then operated on the left eye, and the same series of symptoms followed in the same order; and when she returned home the eyes were weak, but the sight was improving.

Case cccli. M., aged 21, with a hard-looking cataract in the right eye, from a blow, during his childhood. I broke up the cataract more to get rid of the deformity, which interfered with his getting employment, than for the sake of restoring his sight. I operated with a needle through the sclerotic and broke up the lens easily. Pain came on, and a good deal of inflammation, and I bled him, and after that he went on fairly for a time. Leeches and belladonna were again applied, and at last the portion of lens which had fallen into the anterior chamber was absorbed, and the irritation ceased. He was well pleased with the result of his case, but his sight was very imperfect.

Case ccclii. M., aged 35, with very recent cataracts. I operated on the right lens and broke it up through the sclerotic. *He saw the needle moving about in his eye.* He went away with the pupil blocked up by a considerable portion of the lens. I performed, at a future time, another operation upon this eye with a needle and got rid of the rest of the lens, but his sight was not materially improved. I afterwards operated upon the left eye and broke up the lens and capsule thoroughly. The pupil was clearing when he went home, but I never heard whether he regained his sight.

Case cccliii. M. aged 26. Had complete amaurosis in the left eye, of nine weeks standing, but had had a capsular cataract in the right for four years. I operated and depressed the lens, and his pupil remained clear, but his sight was no better. The other eye was, in the mean time, treated with mercurials, blisters, and turpen-

tine, and when he went home his sight had improved a little but was very imperfect.

CASE CCCLIV. M., aged 59, had been blind four years from an injury to the left eye by a twig, which produced cataract and adherent iris, and twelve weeks before I saw him he injured his right eye in the same way. The latter lens I extracted, and the former I depressed; when he recovered, both eyes were tolerably clear but his sight was no better.

CASE CCCLV. M., aged 20, with opaque capsule following iritis, of four years standing, which he was anxious to get rid of, on account of the deformity, as he lost his situation as shopman in consequence of it. His eye recovered after an attack of inflammation, and he went away with a clear pupil, but very indistinct sight.

CASE CCCLVI. M. aged 30. The right eye was lost from corneal disease, and the left was injured by a piece of iron, producing distorted pupil and opaque lens. I broke up the lens, and his sight improved very much. At a subsequent operation, I removed a portion of capsule which still blocked up the pupil and he had good sight for six days, when suddenly a clot of blood was found filling his interior chamber, and severe inflammation followed. He was treated actively but to no purpose, and he is, I believe, at the present time quite blind.

CASE CCCLVII. F., aged 19, with fully formed cataract in the right eye, and very dim and myopic sight in the left. I drilled a hole in the anterior part of the lens by means of a curved needle introduced through the cornea. No symptoms of any consequence followed, and the eye became amaurotic. The other eye is in the same state and she is quite blind.

CASE CCCLVIII. M., aged 50, a tremulous subject with fully formed white cataracts. He had the appearance of being an intemperate man, which, however, I believe was not the case; I broke up the right lens through the cornea, and small portions fell into the anterior chamber. A severe attack of inflammation followed, and I made a section in the lower part of the cornea to get rid of the lens which seemed to irritate the eye. When he re-

covered from this he had very little sight, and was so weak that he could scarcely walk.

Operations for the Removal of Opaque Capsule. The eleven following cases could not well be classed under either of the former heads, and they differ a good deal from one another, having, however, this one point in common, that the operations were undertaken to remove portions of opaque capsule or dislocated lens from the eye.

CASE CCCLIX. M., aged 30, had amaurosis of the left eye for many years, and, as is frequently the case, after a long time, a cataract was developed in it. The day before I saw him, the lens slipped suddenly into the anterior chamber, producing pain. It was of a yellow colour and looked very hard. I made a lower section as for the extraction of cataract; and the knife, in its passage across the anterior chamber, thrust back the lens through the pupil. I removed it with the curette; and the eye was well in two days.

CASE CCCLX. M., aged 63, had met with an accident many years before I saw him, by which his right eye had been ruptured and the sight destroyed, leaving a piece of membrane (the iris, probably) floating about in the eye; and six months before he came under my care, he received a thrust from a cow's horn in his other eye, which also ruptured the sclerotic, and squeezed out the lens; the conjunctiva being unbroken, it remained resting upon the upper part of the globe of the eye, like a round yellow tumour. The eye was excessively weak and intolerant of light. Upon dividing the conjunctiva, the lens escaped, and his eye became stronger in a few days. He went home in a fortnight with his eye sound, and able to see well with a four-inch lens.

We have, of course, met with a considerable number of these cases of dislocated lens, when it escapes through a fissure in the sclerotic, and remains under the conjunctiva until it is let out; but this one is peculiar, from the great length of time during which the lens was in this unnatural position, and the successful termination of an unpromising case. It is also a peculiarity in this

case that the patient ruptured both his eyes accidentally at different times; and, although a little out of place, I am inclined to narrate here in connection with it another instance where a similar occurrence took place. It is probable that in each of these patients the sclerotic was very thin.

CASE CCCLXI. M., aged 61, received a blow in his only eye (the right) a few months before I saw him. The blow was inflicted by his wife, who beat him in this way, and left him; and he was quite blind, and obliged to go to the union. Upon asking him how he lost his left eye, he said it had been struck out by his "first queen"; by which we were to understand that he had formerly had another eye, and also another wife, and that she had ruptured it accidentally by a blow, as the second wife had the second eye purposely. I cannot but think that this man had also very thin sclerotics.

The right pupil was much distorted and very small, and I enlarged it by removing a portion of the iris; and when he had recovered from the effects of the operation, some opaque matter was found blocking up the aperture. This I removed at a second operation, and the pupil was easily cleared, but his sight was no better. I operated a third time, with the view of enlarging the pupil still more, and effected it satisfactorily, but he never saw any better.

CASE CCCLXII. M. The right eye had been lost by accident; and when I saw him, the left had become almost useless from iritis. This eye was soft; but he could distinguish light with each. I extracted, by means of the cannula forceps, through a small corneal aperture, a piece of opaque capsule which blocked up the pupil. He suffered a good deal of pain, but the sight was improved.

CASE CCCLXIII. M., aged 30, had an accident in his right eye in childhood, and ever since his sight had been almost useless. I removed an opaque capsule, which entirely blocked up the pupil, and he saw very well for a few days, but afterwards more dimly, and, upon examination, it appeared that the lens had remained clear behind the capsule, and that the removal of the latter

had caused the former to become opaque. The cataract thus formed was gradually absorbed, and he recovered with fair sight.

CASE CCCLXIV. M., aged 50, an old amaurotic case, in which one eye had been operated on for cataract. The left eye was excessively painful, from the presence of a yellow opaque lens, which had slipped forward, without accident, into the anterior chamber. I removed it piecemeal by a lower section, and the eye soon recovered.

CASE CCCLXV. M., aged 2. This child had been born with cataracts, and had been operated on by some other surgeon for that disease, and the pupils were left blocked up by opaque capsule. I gave him chloroform, and with a small knife made a corneal section, and removed a portion of the opacity from each pupil. He was sick from the chloroform for three days, and then recovered completely, with clear pupils, and evidently saw well.

CASE CCCLXVI. M., aged 40, a labouring man, thin, weak, and ill, suffering from the constant irritation of his left eye, in which was a hard and chalky looking lens. The right eye was so weak that he could not work. The cause of his condition being obvious, I removed it by a corneal section. The lens was adherent all round, and his eye being much inflamed, the operation was extremely painful. From the time when it was concluded, his pain ceased, and the other eye became strong.

CASE CCCLXVII. M., aged 31, from the Blind Asylum. A most unpromising case, with opaque capsule blocking up his pupil. I removed the opacity, and left a clear pupil, but the sight was no better.

CASE CCCLXVIII. M., aged 17, with opaque capsule remaining in the pupil after an operation by another surgeon. I removed it, and he recovered speedily with a clear pupil and good sight.

CASE CCCLXIX. F. The left eye was sightless, and the right much damaged by a former perforating ulcer of the cornea, with iritic adhesion and opaque capsule. I removed the latter without difficulty, and she went away seeing more light, but with her eye still very weak.

The Formation of Artificial Pupil. CASE CCCLXX. M., aged 68, came up to me many years ago with staphyloma of the right eye, and the left pupil was almost closed and blocked up with lymph from rheumatic iritis. The case looked so unfavourable, that I sent him home into the country, although he lived fifty miles away. He would not live contentedly in blindness, and after a time was brought up again, being still able to distinguish light from darkness. I agreed to operate, and made a free lower corneal section with a view to remove a portion of iris. Upon withdrawing the knife, a little pressure being probably made inadvertently at the same time, the adhesions of the iris to the capsule suddenly gave way, and he recovered his sight instantaneously. The eye was strong and well in a week, and he went home with excellent sight, and worked as a labourer for many years afterwards.

This was one of my earliest cases of operation for artificial pupil, and one of the most successful; for his lens had remained perfectly clear; and this patient's unexpected restoration to sight encouraged me to try many others whose cases seemed equally hopeless, and did not turn out so well. There is a very peculiar and indescribable change which takes place in the expression of the face when a blind man is suddenly restored to sight, which I have seen several times, but never more markedly than in this instance.

CASE CCCLXXI. M., aged 59, a Frenchman, who, by the advice of some relatives here, came over from Paris in search of a cure for his blindness. He had iritic adhesions, with central deposit, in each eye; and the pupil in the left was larger than in the right, but he had only the power of seeing light from darkness.

I operated on the right eye, and made a section in the outer and lower part of the cornea, passed in a hook as far as the margin of the pupil, drew the iris out at the wound, and cut it off. The anterior chamber filled with blood at once; but it was soon absorbed, and in less than a week his new pupil was quite clear, and he could see to tell the time by my watch.

Six months afterwards he came again, having a large

clear pupil in the right eye, the central part of the capsule being still covered with lymph; but his sight was very good, and he begged me to operate on his left eye. This I did in the same way as before, and with the like success; and he went back to France able to read easily.

Case cccLXXII. M., aged 47, had lost the sight in the right eye since boyhood from an opaque cornea, to which the pupil had been adherent. The other eye having been recently damaged in the ironworks near Pontypool, by a spark of fire, he was disabled from work. I operated on the right, making a corneal section; and, as the iris prolapsed, I laid hold of it with a forceps, and removed it with the scissors. He saw well at once, and the eye recovered immediately.

Case cccLXXIII. M., aged 60, had been blind for four years before I saw him. He could see the light with both eyes; and in both the pupils were closed, the central part of the capsule being occupied with lymph. The left iris was bulging forwards and discoloured; the right looked more healthy. I operated on the right eye, making a section in the lower and outer part of the cornea. The iris prolapsed slightly, and I removed a triangular portion with a forceps and scissors. He recovered from the operation without any bad symptoms, and had very good sight.

Case cccLXXIV. F., came under my care when a few weeks old. The right eye had sloughed from purulent ophthalmia; and the left cornea had given way below, the centre being opaque. From this most unfavourable condition the child so far recovered that it could see the light; but no pupil was visible, and the right eye was atrophied. When it was one year old, I operated on the left eye. The child was pinned up tolerably firmly in a towel, and the upper lid held with a speculum; and I made a section through the cornea, introduced a hook, and withdrew and cut off a piece of iris. The child showed no sign afterwards that anything had been done to it. The cornoa was opaque for a time, but it cleared, and a pupil was visible; and she evidently could see objects, and recognise her mother's face.

This case is remarkable because of the child's tender age for this operation.

Case ccclxxv. M., aged 50, had his right pupil closed by iritic adhesions and opaque capsule; and the left eye had met with a blow, which produced, in all probability, rupture of the eye; and the pupil had been distorted and drawn up completely under the upper lid. I removed some of the outer part of the iris through a corneal section, and he recovered with good sight. After a time he returned, to request me to operate upon the right eye, which was useless to him. I made a corneal section, and slit up the iris with a fine pair of scissors; and he did well. With a four-inch lens he could see well. In the other eye, the lens remained clear.

Case ccclxxvi. M., aged 15 months, with opacity of the right cornea, and adhesion between the left cornea and iris, involving the pupil, following purulent ophthalmia.

I operated on the left eye and made a section of the cornea and applied pressure. The iris prolapsed, and I cut it off: a small quantity of vitreous humour escaped. He recovered at once, and had a fair sized pupil, reaching to the corneal section. The cornea was a little hazy, but was clearing when he was taken home. It was difficult to determine how much better the child could see, but everything was favourable for sight.

Case ccclxxvii. M., aged 30, a discharged soldier, who had lost his sight in India, probably from purulent ophthalmia, had his left eye amaurotic, with prominent cornea and central opacity. In the right eye, the pupil was closed, and drawn up to a cicatrix in the upper part of the cornea. I made a corneal section, and removed a portion of iris. The cornea was a little dull for a time where the section was made, but it cleared subsequently, and he had good sight.

Case ccclxxviii. M., aged 29, with entire opacity of the right cornea, and closed pupil in the left eye, following a mine-explosion. This was a very unpromising case. I operated on the left eye, and made a minute opening in the upper part of the iris, opposite the clearest part of the cornea. The eye filled with blood at

once; but he said that during the operation he saw the bars of the window distinctly. The blood was gradually absorbed from the anterior chamber, and the left eye became much the best. I operated on the right eye (with prominent opaque cornea, a small portion below being alone clear), and made a small section, and drew out a portion of iris. He recovered well from this operation; and now, both eyes being equal, I made a further attempt on the right. I made a corneal section below with the left hand, drew out some iris, and cut it off. He went away in two weeks, with his sight much improved; but the cornea at the point of section was hazy. I saw him three months afterwards; and his cornea had partially cleared, and he could see to do labouring work.

CASE CCCLXXIX. M., aged 30, had been blinded by gonorrhœal ophthalmia, which produced adhesion of the cornea and iris after sloughing of the cornea in each eye. He was unable to see to do anything. I operated on the left eye in which the sight was the least, and making a free section of the lower part of the cornea, drew out some of the iris with Tyrrell's hook. His anterior chamber filled with blood, and for a time he saw nothing. No bad symptoms followed. The cornea was partially opaque for a time, but it cleared, and he had a good pupil, nearly central, through which his sight was very good.

CASE CCCLXXX. M., aged 23, lost his eye by accident, and the sight of the left was useless to him in consequence of the secondary inflammation. His pupil was blocked up with lymph and adherent to the capsule. I made a corneal section in the left eye and tried to draw out some of the iris, but it tore easily, and the only instrument which would hold it was the cannula forceps. I withdrew some, and the anterior chamber filled with blood at once. The sight was not much improved by this operation, and three months after I repeated it, and succeeded in making a large clear pupil above, by the removal of the iris. His sight was much improved and when I saw him a year afterwards, it was still further improved, and with a four-inch lens he could see well. There was no history in this case which would account

for the loss of the lens, for the accident had happened to the other eye.

CASE CCCLXXXI. M. aged 35. This case was like the last, viz., injury destroying the right eye and consecutive inflammation of the interior of the left eye, rendering it useless by closed pupil and deposit of lymph. I made a free lower corneal section, drew out some iris, and snipped it off as far as the pupil. Blood escaped at once, but after its absorption he saw well. He had no bad symptoms.

CASE CCCLXXXII. M. aged 60. An old man, who has gone through many vicissitudes,* came to me many years ago with incipient cataract in the left eye. I lost sight of him for some years, when he reappeared and I proposed to operate on his left eye in which the cataract was formed, while he had a moderate amount of sight in the right eye. He was persuaded to go to London and had the lens extracted at the Moorfields Hospital, and then he returned to me with opaque capsule blocking up a very small pupil. I made a lower corneal section, and not being able to dislodge the capsule I took off a piece of iris and left a black clear pupil through which he had good sight.

CASE CCCLXXXIII. M. aged 19. His left eye was partly staphylomatous, the right cornea very opaque. With some difficulty I removed a portion of the iris of the right eye through a corneal section, and he had much intolerance of light for a day or two, but afterwards his sight was a good deal improved.

CASE CCCLXXXIV. M., aged 45, had only one eye, and in it the cornea was so dull that he could not find his way about. Standing in front of him, with the left hand, I made a lower section, and as the iris pro-

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* Should the surgeon who operated on this patient at Moorfields happen to read this account, he will possibly recognise his patient by the following history. At my second interview with him, on asking him for his dispensary-card, he told me his pocket was picked of it as he was crossing the Prairie to go to the Salt Lake; Being converted from the errors of Mormonism, he escaped, and now makes a good living by selling an account of the sect and of his own escape. He also lectures on the subject. He left his wife behind him in Wales.

lapsed I cut it off with a forceps and scissors. He went away in a few days with improved sight.

CASE CCCLXXXV. M., aged 36, injured his left eye when twenty years of age, and the result was a closed pupil. The other eye became very dull from iritis about four months before I saw him, Upon operating, and removing a portion of the iris through a corneal section, a large black pupil was formed, but a considerable quantity of fluid vitreous humour escaped. The next day his eye was strong, and he said that he could see fairly.

CASE CCCLXXXVI. F., aged 40, with the left eye staphylomatous, and a large corneal opacity and iritic adhesion in the right. The greater part of the cornea was opaque. I made an upper section, and removed a part of the iris by Tyrrell's hook. In two days the eye seemed to be recovered from the operation, and she went home with improved sight.

CASE CCCLXXXVII. M., aged 30, had a sightless left eye, and in the right he had suffered from a perforating ulcer of the cornea, and very little anterior chamber was left. I operated and withdrew, through a lower corneal section, a small portion of iris, and snipped it off. He went home with his sight much improved, but very weak.

CASE CCCLXXXVIII. M., aged 15, was able to find his way about with the right eye, on the cornea of which was a considerable opacity. In the other eye he must have had a perforating ulcer, for besides the opacity there was anterior adhesion of the iris. I operated on the left (his worst) eye, and by a corneal section, was enabled to draw out some iris and remove it. The next day the cornea was opaque opposite the new pupil, and he had but little sight. It began to clear in a few days and he went home.

CASE CCCLXXXIX. M. aged 40. The right eye had been lost by a puncture with a thorn, and the pupil was filled with lymph, the iris being in contact with the cornea. In the left eye inflammation had come on, and the centre of his cornea had become opaque. I made a small pupil in the left eye without difficulty by a

corneal section and the removal of the prolapsing iris. He had no bad symptoms following, and went away with improved, but still imperfect sight.

CASE CCCXC. F., aged 20, injured her right eye with a penknife when six years of age, and six months before I saw her internal inflammation and iritis had destroyed the sight of the other. The right pupil was closed, the cornea was opaque below, and she squinted with this eye. I removed a piece of iris by repeatedly laying hold of it by a fine forceps through an incision in the cornea. She was a little improved by this operation, and when I saw her after three months, I divided the internal rectus, and cured her squint, and her sight was still further improved. On a third occasion, I attempted to enlarge the pupil still further, but as the vitreous humour began to flow I desisted, and in this case the sight although improved was imperfect.

CASE CCCXCI. M., aged 18, lost his right eye some years before I saw him, from a blow which destroyed it, and the eye was sunken. In his left eye the pupil was blocked up by lymph, but he could see to do some kind of work and to get about. I removed a piece of iris and his eye soon recovered itself, and although improved his sight was indistinct.

Of the remaining cases where the operation of artificial pupil was performed, the first few are incomplete, and in most of the others, although a pupil was made in a satisfactory manner the patient was unable to see in consequence of some other defect of the eye.

CASE CCCXCII. M., aged 62, with closed pupils after iritis. I operated on the right eye and removed some of the lower and outer part of the iris through a corneal section, and the anterior chamber filled with blood. No inflammatory symptoms followed, but he went away before the blood was all absorbed.

CASE CCCXCIII. M. aged 23. The right eye was sunk and the left had been ruptured, and was soft. It was a most unpromising case. I made a pupil in the left eye, but his sight was no better.

CASE CCCXCIV. M. The right pupil was closed by adhesion and opaque capsule, and he suffered from *nycta-*

lopia of the left. I made a pupil in the right eye, with some difficulty, owing to his unsteadiness. The anterior chamber filled with blood, and he saw no better.

Case cccxcv. M., aged 20, had been blind since he was nine months old from smallpox. The left eye was sunk; and in the right there was closed pupil with adhesion of the cornea to the iris. I made a pupil in the outer part of the right eye, opposite the point where the cornea was clearest. He recovered with a bright black pupil, but his sight was not restored in a corresponding degree.

Case cccxcvi. F., aged 70, with amaurosis of the right eye, and the left pupil closed and filled with whitish lymph. I made a pupil of fair size in the lower part of the iris, and she went home in four days with directions to come up and have the cataract extracted; for an opaque lens was seen through the new pupil. I never saw her again.

Case cccxcvii. F., aged 35, with the left eye sunk, and the right pupil blocked up with lymph. I made a pupil in the right iris, and she went home seeing more light. Three months afterwards I operated again, and removed a little more iris, but with some difficulty, as it appeared that the whole posterior surface of the membrane was adherent to the capsule. An increased quantity of light was then admitted. A third operation and a fourth were performed, but with no ultimate success.

Case cccxcviii. M., aged 50, with a pupil in his right eye blocked up by adherent, particoloured capsule. The other eye was lost ten years before, and he had already undergone several operations to try to regain his sight. The case was most unpromising. I removed a portion of iris with some difficulty, for fluid and pellucid vitreous humour streamed from his eye. He saw the light moro strongly afterwards, but received no permanent benefit.

Case cccxcix. M., aged 45, with tremulous iris and no sight in the right eye; in the left the pupil is drawn down to the lower part of the cornea where it is adherent and filled by some opaque matter. I made a corneal section, and with the point of the curette turned out a small oval hard cretaceous lens, leaving a clear pupil.

He saw but little better at first; but six months afterwards he wrote to say that he was much better. I saw him about eighteen months after the operation, and then he could see but little better than before.*

Case cccc. M., aged 50, lost his left eye some years before I saw him by an accident, and in the year 1849 (six months after the original injury) the sight in the right eye began to fail. He had been previously operated on by one of my colleagues, without success. The pupil was blocked up with lymph, the eye soft, and the iris green when I saw him. I made a corneal section, and some *brown aqueous humour ran down his cheek, and his iris, which had been green, at once became blue.* I succeeded in making a pupil, but his sight was no better.

In most of these cases of discolored iris in diseased eyes, I believe that the green hue depends upon this alteration in the humours, and not in the membrane itself; and this particular instance seems to illustrate some remarks I made upon discoloured iris in connection with Case No. 337.

Case cccci. F., aged 55, lost his sight by internal inflammation, and both pupils were obliterated, the left being staphylomatous. I operated on the right eye, and making a lower section removed a part of the iris, leaving a new pupil blocked up with an opaque lens. At a second operation I removed a portion of the lens, but with some difficulty, for she was struggling and screaming continually, and the nucleus remained behind. This came out after a time, but her sight was no better; and after I had made a new pupil without any advantage, the case was given up, and she is now hopelessly blind.

Case ccccii. M., aged 15, lost one eye by accident, and the other was useless from sympathetic inflammation, the pupil being closed. I performed two or three operations with a view to make a clear pupil in the left eye, but without any success; and his eyes atrophied.

Case cccciii. F., aged 19, with staphyloma of the

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* This case should have been arranged in the list of operations for the removal of opaque capsule, but was accidentally omitted.

right eye; and closed pupil, adherent cornea and iris in the left, from smallpox. I removed a portion of the iris from the left eye, and made a pupil opposite the clear part of the cornea. When the eye recovered and all the blood was absorbed, she could see objects better.

Case ccccIV. F. aged 16. The left eye was sunk; and the right had closed pupil and corneal opacities following the measles. I operated in the same way as in the last case, but only a little improvement followed.

Case ccccV. F., aged 21, with eyes exactly in the same state as those described in No. 403; viz., staphyloma of one, and closed pupil of the other with corneal opacity, following smallpox. I operated in the same way and made a pupil, but she saw no better.

These three last cases were inmates of the Bristol Blind Asylum, and being there under my care, I thought it right to let them have a chance of restoration of sight, although the hope was but slight.

Case ccccVI. M., aged 66, an old rheumatic subject with closed pupils, adherent irides, and lymph in the centre. I made a large pupil in the left eye, and for some days was in doubt whether he had cataract or not. Having at last decided that he had, I extracted it through the new pupil; but his retina was unsound, and he saw no better.

Case ccccVII. M., aged 25, a labouring man whose right eye had become entirely opaque, and the left pupil was closed, with adherent iris and capsule and fibrinous deposit in the centre. I took out a piece of iris from the left eye, and it was discovered that he had an opaque lens behind. This I extracted at a subsequent operation, but with some difficulty; for the eye was very moveable, and the black pigment of the piece of iris, which had been removed on a previous occasion, still adhered to the capsule and complicated the operation. A hard opaque amber lens was ultimately removed. This patient went on well for a time, but ultimately inflammation came on and he went home. I have heard casually, lately, that he is getting better, but I can give no reliable account of him.

In addition to the above, I operated upon a man with

conical cornea, as long ago as January 1852, and drew his pupil down to the outer and lower part of the cornea, so as to alter its form, and bring it opposite to a flatter part of the eye. He was well from the operation in a day or two, and the pupil was all that was desired, but his sight was not improved by it. I noted at the time that the eye appeared a little less conical after the operation.

Mixed Cases. To conclude my series of operations undertaken for the restoration of sight, I have brought together, under the head of *mixed* cases, a few instances in each of which several operations were performed; namely, the formation of artificial pupil, with the extraction of cataract or opaque capsule; and they could not very conveniently be arranged with the others. Some are cases of considerable interest, and very successful.

Case ccccviii. F., aged 61, had the lower part of each cornea opaque, and opaque capsule in the left eye, with dulness of the right eye. She could not find her way about. I operated on both, and succeeded in clearing the right pupil of the dulness, with the exception of a portion of capsule. At a second operation, I made a free corneal section downwards; and, not being able to withdraw the capsule, I removed a portion of iris, and extracted with some difficulty a yellow opaque lens. From this operation she recovered sufficient sight to see to go about readily. After a time, her sight became more dim; and I enlarged the pupil, so as to bring it opposite a clear part of the cornea; but it did not succeed; and, although the pupil was made, she went home with her vision very indistinct.

Case ccccix. M., aged 30, had amaurosis of the left eye, and met with an injury of the right, by which the cornea had been opened, the pupil drawn down to the scar, and the capsule opaque. I made at the first operation an opening through the iris, and found an opaque lens behind. When the eye recovered, I extracted the cataract without difficulty. He had considerable headache afterwards, and for this he was bled; and, when he was quite well, I found some capsule

obstructing the artificial pupil. This I removed by a needle-operation; and he went out with fair sight, able to drive a donkey-cart about the city.

Case ccccx. M., aged 8, a healthy-looking red-cheeked boy, was unlucky enough to have his left eye destroyed by a piece of crockery ware and the right by an arrow. The former was quite opaque; and in the latter the iris was adherent to a transverse opaque line across the cornea, and the pupil was almost closed and blocked up with opaque capsule. I introduced a needle behind the iris, and tried to remove the capsule; but in vain, for it was too firmly adherent, and the lens was behind. Upon a subsequent occasion I gave him chloroform, and removed a portion of the iris, when the opaque lens became visible. A little vitreous humour escaped.

I subsequently operated on this little boy three times more. At the third operation, I introduced a needle through the sclerotic, and tried to draw back some opaque matter which occupied the upper part of the eye. At the fourth, I divided the iris with the iris-knife, under chloroform; and at the fifth and last I repeated the section without chloroform. His sight improved gradually; and now he can see to go about everywhere, and distinguish objects, and with a lens can see letters. ' This termination was very satisfactory, considering that the patient had not as much as half an anterior chamber available for all these operations.

Case ccccxi. M., aged 40, injured his left eye by accident, and for ten weeks following suffered much from inflammation. When I saw him, about ten months afterwards, he had adherent iris and capsule and opaque lens in each, and he was blind. I began by making an upper corneal section in the right eye, breaking the capsule, and trying to extract the lens. It was necessary to snip the edge of the pupil with a pair of scissors before I could dislodge it; and, after all, I was obliged to pass in the curette and lift it out, which I did, leaving a clear black pupil, but no sight. At a *second operation*, this pupil having closed partly, I incised it; but he could see no better, and went home; and six years afterwards,

when I saw him again, the right eye had gradually become atrophied and sunk, whilst the left looked stronger. On the third operation, I made a lower corneal section in the left eye (in which the original accident had occurred); and, after trying once or twice to withdraw some iris from the eye, which I could not do because it was soft and gave way readily, I withdrew the capsule, and, seeing the lens opaque behind, I enlarged my corneal incision, and turned it out. Some vitreous humour escaped at the same time, and the eye during the operation had become very vascular and painful. He recovered fairly; and the iris lost its discoloration, and the eye became much more sound. He could see to go about anywhere, and his health improved greatly.

Case ccccxii. M., aged 21, a feeble emaciated youth, came under my care in 1856, with acute iritis of both eyes. The disease was apparently of a strumous nature, and had existed three weeks when I saw him, when he had pus in the lower part of each anterior chamber, corneal opacity and lymph on the iris in the right eye, with purulent deposit in the upper part of the anterior chamber in the left eye. I have seldom seen so destructive a case. He grew progressively worse, and partial sloughing took place; and, when he recovered his health, he could barely distinguish light from darkness. Two years afterwards, his right eye had about the upper half of the cornea clear, but no pupil; and the left eye was flat. At the *first* operation, I made an artificial pupil in the upper and outer part of the right eye, and discovered a cataract behind; and as the poor fellow, who worked to support his mother, had only the chance of sight in this mutilated eye, I allowed it to heal, and, after a time, performed a *second* operation, which consisted in the removal of the cataract through an upper corneal section. This did well, and he recovered a fair amount of sight, and was able to work for a time; but, after a few months, the pupil became blocked up with opaque capsule, and his sight was very indistinct. The *third* operation consisted in removing the capsule through a corneal section; and it was accomplished readily, but

was followed by some inflammation; and his pupil became closed. At the *fourth* operation, I cut across the iris with an iris-knife, and made a good pupil, through which he saw well for a minute or two, when blood was effused, and obscured the vision. After this he recovered partial sight, so as to be able to get about; but his pupil was not satisfactorily clear; and therefore, for the *fifth* time, I operated, and removed by a needle some opaque matter which occupied part of the pupil, and he regained his sight. He now sees very fairly with a four-and-a-half-inch lens, and his health is much improved.

Case ccccxiii. M., aged 55. (I introduce this case from the similarity in its origin to the last.) The patient was, for his age, an old-looking man, weak and ill, with pus in the anterior chamber of the right eye, following an abscess in the cornea of a month's standing, which gave way internally. The pus increased in spite of treatment, until it had reached above the margin of the pupil, giving a dull appearance to the capsule. He could make out the light from darkness, but could not distinguish the bars of the window-frame with this eye. I made a lower corneal section, to get rid of the pus; but it was very thick, and did not escape readily with the aqueous humour; and he went home with no sight in this eye, the left being good.

Exactly a year afterwards, this patient came up again with the same condition in the left eye, namely, an internal abscess discharging into the anterior chamber; but the other eye had become strong, and in it the lower half of the cornea was completely opaque, the iris adherent to it; and a small oval pupil existed just above the corneal capacity through which he saw tolerably well. The progress of the disease in the second eye was like the first. I made a section, to save the organ. He went home entirely dependent on the sight in the right eye, that first affected; and when I saw him for some other ailment, three years after, the left eye was exactly like the right, with corneal opacity, adhesion, and minute oval pupil, with very good sight. There was an

unusual degree of parallelism in the origin, treatment, and result of the disease in these two eyes.

Case cccxiv. F., aged 52. I began the treatment of this patient as long ago as the beginning of the year 1857, when she had been blind with the left eye for fifteen years, and the right for one year. In both there was closed pupil, adherent iris and capsule, with lymph occupying the position of the pupil.

I made, first of all, an artificial pupil in the left eye, by removing a part of the iris at the lower and outer corner of the anterior chamber through a corneal section; and she saw better afterwards, but not well, for the lens was opaque. At the *second* operation, I made an artificial pupil in the other eye; and she went out with more sight, and a good sized aperture in each iris. Some months afterwards, I extracted the left lens by a lower corneal section. A little vitreous humour followed, and the cataract was very dark. She recovered fairly, with a very small pupil, but sight enough for her ordinary domestic work. A *fourth* operation was performed a few months afterwards, when I removed the cataract from the right eye, and she obtained some sight in it, but it was imperfect. She managed, however, to get on comfortably for eighteen months, when she reappeared, blind once more. The right eye had an indistinct pupil in it, partially occupied by opaque capsule; and the small pupil that existed in the left eye had become too contracted for useful sight. I therefore, on the fifth operation, made a cut across the iris of this eye with the iris-knife, and she regained excellent sight instantaneously. The pupil thus made became gradually almost round; and I supplied her with a two and a half and a four and a half inch glass, with which she saw very well.

Remarks. The operations for artificial pupil, although generally performed upon damaged eyes, are, on the whole, very satisfactory and successful. No regular and systematic directions can be given as to the mode of operation, and the surgeon must act in each particular case according to its special peculiarities, remembering that a hole is to be made in the iris opposite a clear part

of the cornea; and, of course, the nearer to the centre the better. The actual plan to be pursued can only be decided after the first step of making a corneal section has been taken. The exception is in the case of closed pupil after the extraction of cataract; for there, a cut with the fine iris-knife will restore sight as if by magic; and, if the incision be expertly made in the middle of the iris, the pupil attains a wonderful degree of roundness.

I have no experience of a plan recommended some time ago, according to which a piece of iris was to be tied at the edge of the cornea; nor can I understand how it can have any advantage over other modes of proceeding.

A perusal of the foregoing cases (from No. 359 to 414) will also shew some other points of interest. Probably twenty of them were blind of both eyes, because one had been injured; and to this I will add my belief that, in any of these, extirpation of the injured organ would have saved the other; and the examination of similar cases at the Bristol Blind Asylum originally suggested the idea of excising the damaged eye.

When the cornea has been opaque from inflammation or accident, and has afterwards cleared, and a section is made in it for the purpose of making an artificial pupil or removing opaque matter, it will become cloudy again after the operation, and in time will be restored to its former transparency; but this is a work of some time, and many cases thus turn out better than they promised, or are supposed to do, because they cannot be kept under the surgeon's care sufficiently long.

When the cornea sloughs, and the pupil is closed from small-pox or purulent ophthalmia, the lens generally becomes opaque also; and when a stain of blood is left on the knife after making a section of the cornea, the cases invariably do badly from inflammation or sloughing.

The late Mr. Estlin read a paper upon injuries to the iris, at one of our general annual meetings, at Leeds, and he showed how little this membrane resents injuries inflicted upon it, either by accident or the surgeon's hand.

In that paper, he describes the operation I have alluded to, of dividing the iris by the "iris-knife," a fine narrow blade, scarcely wider than a needle, which is introduced across the anterior chamber, and then its edge being turned towards the iris, a sudden movement of the hand runs it through the iris and withdraws it instantly. I have above narrated many cases where this little operation proved very successful. If there be an opportunity of selection, the cut should, of course, be made at right angles to the strained fibres of the iris, as thereby a larger, and somewhat circular, pupil is made.

Staphyloma. The operation for the relief of the irritation caused by staphyloma is not unfrequently called for, and is invariably successful. I will describe a few, of which I have preserved some notes, and they will be sufficient to indicate the progress of such cases.

Case ccccxv. F., aged 17, with staphyloma of the right eye from an injury. I removed it, and a clot formed, and after a certain amount of suppuration, the part healed. Her eye was unusually sunken afterwards; but an artificial eye was introduced.

Case ccccxvi. M., aged 3, with staphyloma of the right eye of eighteen months standing. With tenaculum and knife I removed the cornea, and some vitreous humour followed. The lens did not come out. The child was taken home on the sixth day with the wound almost healed.

Case ccccxvii. F., aged 17. Her right eye was opaque, the left very prominent. I removed the front of it with a tenaculum and knife, and the lens and some vitreous humour followed the section. There was a little hemorrhage. She complained immediately of great pain in the head, which lasted a few days; the eye slowly contracted and did well.

Case ccccxviii. Aged 4 months, with staphyloma of the left eye after purulent ophthalmia. The vitreous humour gushed out, and the eye looked collapsed immediately the anterior part was removed, and some little hemorrhage followed. A compress and bandage was applied. The wound was healed in eleven days.

Case ccccxix. M., aged 18, with staphyloma of the right eye. A week before I saw him, as he was blowing his nose, sudden pain came on in this eye. I removed the front of the eye; and it appeared that a hard chalky lens had escaped into the anterior chamber and had produced the irritation. Some healthy vitreous humour escaped with the lens, and it was necessary to divide the hyaloid membrane with a scissors. There was a little hæmorrhage, but he soon recovered.

Case ccccxx. M., aged 10. I removed the cornea with a tenaculum and scalpel. The vitreous humour did not escape at first; but in puncturing the clear surface of it with the point of the knife, it gushed out suddenly, and the eye became collapsed. He recovered speedily.

Case ccccxxi. M., aged 11. (I operated on this patient under chloroform; all the previous ones were without.) I removed the cornea, and the iris, which was adherent to it, and the lens followed. He recovered immediately.

Case ccccxxii. F., aged 13 months, with staphyloma of the left eye from birth. The cornea (very much thickened), and the iris adherent to it, with the lens and some vitreous humour, were removed, and the wound healed at once.

Case ccccxxiii. F., aged 22, an otherwise good-looking young woman, with very prominent eyes. I operated under chloroform; and passing a needle and thread through the cornea, removed it, with the lens and some vitreous humour. A clot ultimately formed in the eye, and was discharged, and she recovered well. She called upon me sometime afterwards with an artificial eye, and it was difficult to recognise her.

Case ccccxxiv. F., aged 11. I operated without chloroform, removing, by tenaculum and knife, the cornea and iris, and some vitreous humour. She was soon cured.

Case ccccxxv. M., with staphyloma of the right eye, the irritation of which kept his left eye weak. With tenaculum and knife, I removed the cornea. There was

an unusually free flow of blood, and after a day or two a clot projected from the eye. The case did very well.

Case ccccxxvi. M., aged 30. I operated under chloroform; and as another plan had been recommended, I tried it in this case. With a strong silk, I tied up his cornea by the (so-called) Fergusson's knot, *i.e.*, a double figure-of-eight knot, and punctured it as well. He suffered more pain than is usual after these operations; but the case did perfectly well.

Case ccccxxvii. M., aged 4½. In this, and other subsequent operations, I returned to the old plan, and removed the cornea and iris, with the aid of the tenaculum and knife. The mother took the child home, and when I saw it, in a few days time, acute inflammation and suppuration, with severe constitutional disturbance, were set up, which afterwards subsided, and the case did very well.

Remarks. I believe that, in performing this disagreeable operation, the old plan of simply cutting off the projecting part is the best. During the time that I was surgeon to the Blind Asylum here, I operated on a considerable number of such cases; but I have no particular record of them. I found, not unfrequently, that the patients, seeing a great glare of light streaming through the vitreous humour, after the removal of an opaque cornea, were much disappointed that they did not recover any sight.

There are two symptoms following operations on the eye, of very constant occurrence, and very painful to the patient, and unmanageable: they are the vomiting (in young subjects particularly) which follows needle operations for cataract, and the intense pain at the back of the head and brow, which follows equally frequently the operation for staphyloma, particularly if much vitreous humour have escaped. I cannot explain the pathology of these symptoms; nor do I know how to treat them with full confidence of cure. Opium does not answer our expectations in such cases. I have formerly bled adults from the arm, and this plan seemed most effectual. It is important to get rid of the lens in staphyloma operations.

Strabismus. CASES CCCCXXVIII — DCX (inclusive) are represented by one hundred and eighty-three instances of operation for the cure of squint, of which I have kept a record; and, as to particularise each one of them in the pages of the JOURNAL would be impossible, I have brought them together, and have briefly arranged them as follows:—Seventy were male, and one hundred and thirteen female; they varied in age from 4 to 51 years; in eighty the right eye was operated on, in eighty-six the left, and both in seventeen; one hundred and seventy-four were internal, eight external, and one inferior; forty-eight were below 10 years of age; fifty-one between 10 and 15; fifty between 15 and 20; twenty-six from 20 to 30; and eight above 30.

In six, there was no improvement; but in almost all the rest the cure was very good. In ten, a granulation appeared, which required to be snipped off; and in nearly all the sight was improved in a very marked degree. Forty-one were operated on under chloroform; but for the last two or three years I have invariably refused to give it; and if patients insist upon it, for this operation, they must go to some other surgeon. It appears that there have been recorded at least two deaths from chloroform in children who were to have been cured of squint, and many more may have happened; and to avoid the pain of a slight operation undertaken to remove a deformity, when there is no danger to life, is not worth this amount of risk, small though it be; and to insure complete temporary paralysis of the muscles of the eye, the anæsthetic must be administered to its full extent. I have only in one or two instances found patients refuse to submit without chloroform; and that it is not necessary, I think it a sufficient proof to say that I have operated on children of the ages of 4, 6, 8, 9, and 10, who have remained quite steady, and in whom the operation was as readily and satisfactorily performed as in any others; and if at that age by a little persuasion they can be made to bear the pain, it is surely better than the inconvenience and risk of chloroform. In one of the instances where I gave chloroform, the following untoward event occurred, and I attributed it myself to the

effect of the anæsthetic in preventing my examining the eyes at the time of the operation. A child with a very bad squint in the right eye was operated on by me under chloroform. I divided the muscle, as I thought, and saw the bare sclerotic. The next day she squinted as much as ever, and it was clear that the division of the muscle was incomplete; I, therefore, gave her chloroform again, and introducing the blunt hook through the same conjunctival wound, raised one or two fibres of tendinous tissue, and after dividing them the eye became straight. The second operation would not have been necessary had not the child been insensible at the first.

The cases in which I have operated on both eyes at the same time have done very well. The youngest was 9 years old, and the eldest was a man of 50.

In the case of strabismus inferior, in which I divided the inferior rectus, the improvement was not as great as I expected it would be. I experienced more difficulty in dividing this muscle than in the case of either the internal or external rectus, on account of the small space between the globe of the eye and the floor of the orbit, and the prominence of its lower edge. Slight improvement ensued.

The operation for strabismus differs from all others in respect of the motive by which patients are induced to submit to it. The more common reason which leads young children in this neighbourhood to submit to it, is that manifestation of the evil spirit in their schoolfellows which prompts them to persecute every unfortunate child with a squint, painfully bashful as they are at all times, with the name of "cock-eye"; there is also the very excusable desire to get rid of an obnoxious deformity. I operated upon a woman 50 years of age, who had been obliged to be separated from her husband in consequence of his dissolute conduct; and being, by two separate operations, cured of an intense squint in both eyes, she expressed much gratitude and her satisfaction that her husband, who was in search of her, would not be able to recognise her or prove her identity,

and thus he would be unable to claim some little money she had saved in service.

In my opinion, the most interesting results obtained by strabismus operations have reference to their effect upon vision, and the light thrown upon the physiological question of the adapting power of the eye to distances; and, at the risk of digressing a little from the practical subject of my papers, I will say a word or two relating to this function, and the aid obtained for physiology from pathological facts.

Squinting eyes, when the sight is defective, as it generally is, are usually myopic, and when the patient is cured of the deformity, besides improved clearness of sight, and besides the immense gain of obtaining the true stereoscopic effect,* instead of the flat picture which he has hitherto seen, the eye ceases to be myopic; and of this we have constantly such proof as the following case affords.

CASE. M. A. R., aged 28, had suffered from an attack of inflammation in the right eye about six years before I saw her, and she consulted me about an external squint in this eye. With it she could see to distinguish the red colour of a scarlet shawl at three yards distance; but she could not discern any form. A concave glass assisted her sight. I operated, and divided the external rectus with the forceps and scissors, without introducing the hook, and the eye became central at once, and the sight was immediately so much improved that she could not only see the shawl and the pattern upon it, but could see her bonnet strings, and make them out clearly, at the same distance. Her sight improved for some days, when she ceased to attend.

I believe that any change which occurs in the eye in order to adapt it to different distances, is so minute as

* It is worthy of remark that, if the axes of the eyes are straight, the true stereoscopic effect of relief is perceived, even though the sight of one eye is excessively dim; the eye which sees correctly and clearly being principally used, the other merely joining in to assist in the appreciation of distances; and exactly the same fact is to be noticed when, with two sound eyes, we look into a stereoscope at a good and a very imperfect picture of the same object, taken at a suitable angle. The one eye sees the picture, the other throws it into relief.

not to be appreciable by ordinary measurement, even were it possible, and for the following reasons: with an optical apparatus arranged like the eye, with a diaphragm having so small an aperture as the pupil, everything is in focus, both near and distant objects. That this clearness of the image of objects at different distances is attainable without difficulty, may be seen in an ordinary photographic camera, or in any of the very common, but still wonderful, stereoscopic slides, which are taken on flat plates with an aperture much larger than the pupil; and, heterodox though it be, I must express my opinion that the real power which any eye has of adapting itself to distances is extremely small; not that we have any difficulty in seeing distant and tolerably near objects, but that the necessary change effected in the eye is next to nothing.

We direct our eyes to certain objects and see them, and we may by a little practice see a near object and a distant one in the same line of vision, at the same time, although, perhaps, not with equal distinctness.

Presbyopic and myopic persons have the focus of their eyes fixed respectively for distant and near objects and they can see no others clearly; they have the same muscles and other apparatus that we have, but their instruments are out of focus, and they require an additional (or artificial) lens to make them available for all purposes.

A person with ordinary sight cannot see objects so closely as a near sighted person can; and it must be remembered that it is not in seeing distant, but near objects, although at various distances from the eye, that the chief alteration in adjustment is required; and the natural means at our disposal are insufficient for this purpose to any great degree.

We frequently see that a near-sighted person who puts on his glasses in the morning, wears them comfortably without intermission all the day, and with their aid can see all that he requires to see; and from these facts I infer that we all have a certain range of vision, some greater and some less; the presbyopic and myopic have the least power, whilst persons with ordinary vision

have the focus of the eye fixed at the most convenient point.*

Again, the resemblance between the iris and the lids has often been described. The *portio dura* supplies the *orbicularis palpebrarum* with its motor power; the lower division of the third nerve supplies the iris, and the optic and fifth nerves are the afferent nerves of both lids and iris. The eyelids and iris act together; they are both widely open when we are looking at distant objects; they are both partially closed when we look at near objects; and they both are shut as far as they can be when we sleep. In the first case, all the muscles supplied by the lower division of the third nerve are relaxed as much as possible; in the two latter, they are more or less contracted; and with these conditions of the iris and eyelids we may compare the interesting fact that when there is an extraneous substance, as a minute particle of metal, irritating the eye by being partially imbedded in the cornea, we have a very similar result, namely, the sphincter muscle of the iris and the orbicularis palpebrarum are spasmodically contracted, through the intervention of the fifth nerve. A distant object may be seen through a very small pupil, but a very near object cannot be seen with a dilated pupil; and it is not to admit more light that the pupil dilates when distant objects are seen, as most writers have assumed, for distant objects are very light, a fact well known to artists and photographers, and Mr. Ruskin, in his lectures, lays great stress upon it; and a man on the look out, as a sailor at sea, shades his eyes with his hand to shut out the light. This dilated state is that condition of the circular muscle of the iris which is associated with complete relaxation of the internal rectus; in other words, the muscles supplied by the lower division of the third nerve contract together and are relaxed together, and when they contract we see near objects clearly, and when

* It must be borne in mind, that opticians are able, by the use of various kinds of glass, and by different forms and combinations, to make lenses identical with one another in their aperture and angle and focal distance, but varying extremely in "penetration", or their power of bringing into focus at the same time, objects of different distances.

they are relaxed we see distant objects clearly; and I believe that the pressure of these muscles and the varied aperture of the pupil are amply sufficient to produce the very trifling change requisite to enable a healthy eye to see objects at different distances.

Extirpation. I have already at different times published many of my cases of extirpation of the eye and have now only to recapitulate them very briefly with one or two additions and remarks. They are in the following order: cancer in the child, which is always of the soft kind; secondly, cancer in the adult; thirdly, melanosis; and lastly cases where the eye has been extirpated to preserve its fellow.

Cancer. Case dcxi. J. A. W. aged 2½ years. In the right eye there had always been a white spot and it had been sightless and red and weak. A fortnight before I saw it the disease began to increase suddenly, and the cornea having sloughed the carcinomatous growth protruded from the eye. The gland in front of the ear became enlarged. I removed the contents of the orbit cleanly, and the child appeared quite well a week after, but a month afterwards the disease returned and shortly destroyed the patient.

The cancer-cells were well marked, and principally rounded.

Case dcxii. J. J. aged 2½ years. This was a similar case, and I removed the contents of the orbit, about six mouths after the first appearance of the disease. It returned shortly and the child died about six months afterwards.

The former of these two cases was probably congenital, as cancer undoubtedly sometimes is, without any disease in either parent; and in the second it was of more recent growth. I have operated in other cases of a like nature, but I have no record of them; they were, however, all alike in one particular, viz., that the disease returned and the patients died.

Case dcxiii. L. C. aged 18. A strumous subject with threatening of disease of the lungs. The growth

in the eye began as a tubercle on the iris, and I saw it from the commencement. After the lapse of a year I extirpated the eye, and the patient had a tedious convalescence. She died about a year afterwards of tubercular phthisis, and there had been no return of the cancerous growth. The microscopic appearances were very characteristic, being cells, large, mostly round, with well marked nuclei and nucleoli.

Case dcxiv. L. R., aged 31, presented himself first of all with a granular growth from the lower lid which was dissected away. Fifteen months after the first operation, the disease having returned, a second was performed, and actual cautery was applied to the surface. About eleven months afterwards (and thirty-two months after the first appearance of the disease), I removed the whole mass, with the eye and contents of the orbit. He died three months afterwards, nearly three years after the first onset of the complaint.

The microscopic examination of each portion of tumour was the same, namely nuclei and nucleoli, and round and fusiform cells. The cancerous growth had reached the brain.

Case dcxv. W. B., aged 53, was the subject of a melanotic deposit underneath the conjunctiva, and close to the cornea, the tissues looking as if they had been stained. The disease gradually spread over the cornea, and to the conjunctiva of the lids, and I removed it a year after I first saw him. He was very much relieved for a time, but four months afterwards the tumour reappeared and grew rapidly, and he died after a period of excessive suffering and discomfort. He had melanosis of the brain, skin, peritoneum, and many of the other internal organs.

Case dcxvi. S. T., aged 47, came under my care in consequence of internal mischief in the left eye which produced great dimness of sight and some pain, with a varicose condition of some of the conjunctival vessels. This state yielded to treatment, and she became relieved of her pain and discomfort, but the sight was much impaired, and gradually lost. I saw her occasionally for a period of four years, during the greater

part of which time no alteration took place, but subsequently the pain increased and became of a neuralgic character, and the interior part of the globe became more prominent, having exactly the appearance of the eye when it is affected with *staphyloma corporis ciliaris*. Her sufferings became so great, and the weakness of the other eye interfered so much with her comfort and occupation, that I advised her to submit to the removal of the anterior part of the globe with the view of allowing the humours to escape. I accordingly removed the cornea, but instead of the sudden gush of clear humours which I had expected, I found the eye full of a black coagulum which I partially got rid of. This was in February of the year 1859, and by the following April the disease had so far extended that another operation was requisite, and therefore I removed the globe and the contents of the orbit, and found the cavity full of black and tolerably firm cancerous tissue. There was free hæmorrhage for a short time, and for a few weeks she was relieved. By October the tumour had reappeared, and extended forward nearly an inch from the orbit, reaching down to the level of the mouth, but the lids were not affected, nor were they throughout the progress of the case. I tried various kinds of caustic, namely, sulphuric acid, nitric acid, chloride of zinc, nitrate of silver, caustic potash, and the dried sulphate of zinc. The only one which seemed very effectual was a paste made with concentrated sulphuric acid and dried sulphate of zinc, and this answered admirably, but she could not bear its frequent application. Under its use the swelling was nearly destroyed and the lids became flaccid, but an attack of erysipelas interfered, and she was much weakened. There appeared to be no disposition in the disease to infect the surrounding tissues, nor was there any satisfactory evidence of disease in the other organs. At one time she had a great tendency whilst walking to fall forwards, and I thought that she had probably melanosis of the anterior lobes of the brain, but this symptom afterwards disappeared. She died rather suddenly about eighteen months after the

first operation, and nearly six years after the onset of the disease.

In its earlier stages, this case might possibly have been benefited by an examination with the ophthalmoscope, which I had never used at that time, although beyond the scientific interest of discovering a growth at the back of the eye it is more than probable that the result would have been the same. I can hardly think that the patient was the subject of this malignant disease for so many years, and I think it more probable that it was an instance of secondary degeneration with a rapid development of the new cancerous tissue combined with black pigment and a very vascular state. No *post mortem* examination was made.

Extirpation for the relief of the other Eye. Case dcxvii. (Published before, Feb. 5, 1851.) J. F., aged 46, injured his left eye with a piece of iron thirteen years before I saw him, and he had frequently been laid up with attacks of severe pain and inflammation, and for nine months previous to his becoming my patient he had been disabled. I removed the eye and on the tenth day he went out well, and returned to his work at once. This was my first case of extirpation of the eye for this object.

Case dcxviii. T. B., aged 14, cut his left cornea, iris, and lens with a butcher's knife, and ten weeks after the accident I removed the remains of the eye (which was becoming atrophied), in consequence of dimness and intolerance of light in the other eye. He was quite cured in four weeks.

Case dcxix. D. N., aged about 55, had been under my care for many years, for an intense neuralgic condition of the face and head, apparently originating in an injured eye. The other eye was excessively weak, and he was quite unable to work. He had undergone all kinds of treatment at my hands and under the care of other surgeons, and among the means used may be reckoned: blisters, leeches, mercury, setons, iron, quinine, opium, and ultimately, the long issue in the scalp, which latter relieved him much. I gave him some

chloroform, with the intention of removing his eye while he was insensible, but his pulse became so intermittent that I was obliged to operate without. He struggled a good deal, and it was not an easy case, as the aperture of his eyelids was very small. He recovered and was able to return to his work and he grew stouter, but he had now and then an attack of neuralgic pain, although not comparable in severity to his former sufferings.

Case dcxx. C. H. aged 15. The right eye, which had been injured by a piece of crockery, and had given rise to much pain and intolerance of light and dimness of sight in the other eye, was removed by me in the usual way, under chloroform. She went out cured in a very short time.

Case dcxxi. S. C. aged about 56. The right eye was removed in consequence of long standing disease involving the cornea and iris. I found considerable difficulty in this case also, in consequence of the small aperture between the lids. The patient did remarkably well.

Case dcxxii. H. T. aged 55. This patient was nearly blind from internal disorganisation of the right eye. Her left eye was almost useless to her from the dimness and intolerance of light, and the disease in both had been of long standing. She refused to take chloroform, and therefore I operated without. She recovered well, and has retained the use of the other eye, which was rapidly failing before the operation.

The great peculiarity in this case was the condition of the eye. The cornea was opaque, rough, and yellow; the lens hard and also opaque was loose in the anterior chamber; the pigment internally had disappeared, and occupying the position of the choroid was a thin delicate shell of bone, brittle and hard and semi-transparent in its nature.

This ossification of the choroid coat has not been noticed much by authors, obviously on account of the want of opportunity of examining many specimens which existed before this operation became established. Gross, in his very comprehensive volume on pathological anatomy,

gives an account of this state, but with that exception I have seen no notice of it.

The following case, the last I have to narrate of extirpation of the eye, is another instance of this nature.

Case dcxxiii. G. H., aged 35, lost his left eye by an injury with a peg-top, when a young boy, and a few years before I saw him he had undergone an operation for the removal of the opaque lens in this eye. The operation did not succeed, and constant pain and irritation with great intolerance of light followed it, and he was unable to attend to business. I removed the remains of the left eye, and he was better the next day than he had been for years, and the result of the case was very satisfactory.

There was partial collapse of the globe, and a folding of the sclerotic. The posterior part of the choroid was firmly ossified, with a small round hole in it, where the optic nerve was connected with the retina. The bony substance which replaced the choroid was thicker and firmer than in the former case, where it formed a delicate shell.

Remarks. The instruments required for this operation are a curved scissors, a scalpel, a forceps, a strabismus hook, and the wire speculum. The globe only is to be removed, the muscles being divided close to the sclerotic, and no section of the outer commissure of the lids, required for the removal of cancerous and other tumours of the orbit, is necessary. The case is clearly one where chloroform is advisable, although one of my patients (Case 630) preferred to submit without. After touching with a sharp scalpel round the conjunctiva, about the eighth of an inch from the edge of the cornea, I have found it convenient to raise the recti muscles one after the other upon a strabismus hook and divide them, when the globe starts forward and the division of the optic nerve and other posterior connections is readily accomplished.

Trichiasis : Entropium : Ectropium : Ptosis. This is the last group of operations about the eye, and in-

cludes some of the minor cases, and they are few in number.

Trichiasis. Case dcxxiv. A. B., aged 21. The middle portion of each upper lid turned in so that the lashes brushed the eyes, and she could not see to follow her employment. I introduced a needle and thread, and dissected off the skin with the bulbs of the eyelashes, down to the outer surface of the tarsal cartilage. It was a very painful operation; but when it was completed in each eye, I touched part of the surface lightly with the nitrate of silver. She went home cured in a very few days.

Case dcxxv. M. C., aged about 30, with opacity of the left cornea, and great vascularity and partial opacity of the right, in consequence of inverted lashes. I operated on the right eye, and removed the cutaneous margin of the lid down to the cartilage. Owing to the inflamed condition of the parts, the bleeding was tolerably free. In the other eye, the lashes being very few, I simply extracted them. No chloroform was given. In two days she was much improved, and recovered her sight in the right eye speedily.

Case dcxxvi. W. L., aged 10, with well-marked trichiasis of both eyes. I operated under chloroform, and removed with some difficulty the bulbs and skin of the outer part of the edge of each upper eyelid; and finding that the eyelashes upon the inner half of each upper lid were more easily kept in proper place, I removed a small piece of skin close to the tarsal margin, and introduced a fine suture. He speedily recovered.

Case dcxxvii. M. B., with long-standing trichiasis of both eyes, the left the worst. I operated on the left, and after introducing the thread along the margin of lid, I removed the skin and bulbs down to the tarsal cartilage. The internal palpebral artery bled so freely that it was necessary to tie it. His eye speedily grew better; but he left Bristol before the recovery was complete.

Case dcccxxviii. W. S., aged 15, a strumous lad, with rickets of the right arm and forearm, and complete in-

version of the lashes of both upper eyelids. I operated first on the right, and three days afterwards on the left eye; and his eyes, which had been much weakened, became stronger, and his sight clearer, as the corneal opacities began to disappear, and he went home much better.

Case dcxxix. T. D., aged 24, a small undeveloped individual, looking like a boy of 14, had trichiasis of long standing in both eyes, and he had undergone much treatment. His corneæ were becoming opaque. I operated in the usual way, first in the right eye, as it was much the worst, and afterwards in the left, applying the nitrate of silver on the latter occasion. The wounds healed at once, and he recovered his sight satisfactorily.

Entropium. Case dcxxx. A. H., an old man, with complete inversion of both lower lids, which rolled over into his eye whenever he winked them; the tarsal cartilage was entirely dislocated, but not in itself distorted in any way. I removed a portion of skin and sewed it up, and the lids were kept out.

Case dcxxxi. A. B., aged about 40, with inverted tarsus of the lower lid. I operated as before, and removed the stitch the next day, and he was well.

Case dcxxxii. M. P., aged 40, had been under the care of many surgeons, in consequence of the inversion of both lower lids to such an extent as to cause opacities of the cornea. The case was unusually obstinate. I operated, and removed a piece of skin from each lower lid and sewed up the wound. She was much better for a time; but the diseased condition returned, and I operated a second time, taking out some of the muscular fibres of the orbiculares palpebrarum. She then recovered perfectly.

Case dcxxxiii. E. F., aged 50, with entropium of the right lower eyelid. I operated, and before I drew together the two sutures, I snipped out some of the muscular fibres. Two days afterwards, she was quite cured, and remained so.

Ectropium. Case dcxxxiv. E. W., aged 20, had from her infancy one eye which was useless to her for the purposes of vision, and this being inflamed, was poulticed for a week under surgical advice. The tarsal cartilage of the lower lid was everted; and the conjunctiva covering it was so swollen that it was as large as half a walnut. It was red and not particularly sensitive. The lid was so everted that its cutaneous covering was in contact with the cheek for more than a week, during which the poultices were applied, and the result was the conversion of the skin into mucous membrane. After trying various local applications, I removed it with a tenaculum and scalpel, and she soon recovered.

I have removed portions of swollen and inflamed conjunctiva in cases of complete eversion from lippitudo, and frequently with great advantage. I can give no special account of the progress of the cases, nor of their number, and, therefore, do not include them in my reports; but I may add that even in very severe cases of this disease (lippitudo) by suitable local and general treatment, wonderful improvement often takes place, and the cartilage regains its natural position without operation. The principal remedies are tonics and fresh air, and locally a weak solution of nitrate of silver, and the ointment of the nitric oxide of mercury.

Ptosis. Case dcxxxv. M. A. B., aged 30, with ptosis of both eyes. The lids were so relaxed and weak that she could not raise them. It did not appear to be a case of paralysis of the third nerve. I operated upon the left eye, and removed a piece of skin. When it had healed there was still some drooping; and I removed an additional portion, and she went away cured in this eye. About eight months afterwards she returned, and I operated on the other eye, and there was a very satisfactory result in each.

Case dcxxxvi. B. C., aged 60, an old widow, with lids so relaxed that although she can open her eyes they soon close again. I removed a piece of skin from them, and applied two sutures, which were removed the next day, and she recovered.

CASE DCCXXXVII. A. F., aged about 40, the housekeeper of a wealthy lady in the neighbourhood, applied at the eye dispensary, on account of well marked ptosis of very long standing in one eye, dependent on relaxed skiu. I operated on her, and removed some skin ; and, for the result, it promised well; but she went away, stitches and all, and I never saw her again.

CASE DCXXXVIII. G. A., aged 9, with congenital ptosis of the right eye. I removed a portion of skin sufficient to raise the lid, and introduced two sutures. He weut away in a week cousiderably improved, but the wound was not entirely healed.

CASE DCXXXIX. A. J., aged 18, with congenital ptosis of the left eye. I operated, and took away a piece of skin, and introduced two sutures. The next day, I took out the stitches, and the day after he went home very much improved.

REMARKS. There are one or two points worthy of notice with reference to the mode of treating these minor surgical diseases. The recent cases of ptosis which we not unfrequently see connected with paralysis of the other parts supplied by the third nerve almost always get well, and they are not suited for the cure by operation. The eligible cases are those where the skin is so relaxed that the levator although able to contract, cannot elevate the lid sufficiently, and eutropium of the lower lid corresponds in its pathology to ptosis of the upper. The cures performed by these operations are very rapid and satisfactory. In ptosis and entropium, the patient gets up out of his chair cured, when a suitable piece of skin has been removed.

In operating, I introduce one or two straight needles beneath the skin to be removed, iucluding rather more than appears necessary, and then after snipping off the fold with a sharp pair of scissors, so as to expose the needles, but not to free them from their hold on the skin, I draw them through, and sew up the wound. This plan avoids the little dragging and difficulty sometimes experienced in inserting the needles after the wound has been made, and obviates the necessity of an assistant.

I have seen most satisfactory results follow the application of caustic potash in a fine line parallel to the edge of the tarsus, so as to cause a slough, the subsequent cicatrisation of which is sufficient to draw out the lid; and of two patients who refused to submit to the operation I advised, one was permanently cured by the repeated application of collodion to the lid, and the other has adopted ingeniously a small silver loop to the lower margin of his spectacles, which he wears continually, and this pressure on the skin of the lid is sufficient to keep it in place.

The application of the nitrate of silver to the raw surface after operating for trichiasis is an effectual, but a very severe measure, and only advisable when the bulbs cannot be entirely removed by the dissection.

The combined proceeding of taking off a part of the skin of the margin of the lid, and, for the rest of the lid, a small piece at a distance from its edge, will be found applicable to many cases.*

* At the period assigned as the end of these "ten years", I had no experience of the three new operations; viz., iridectomy, the division of the ciliary ligament, and slitting up the canaliculi.

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