

Surgical observations, with cases and operations / by J. Mason Warren.

Contributors

Warren, Jonathan Mason, 1811-1867.
Francis A. Countway Library of Medicine

Publication/Creation

Boston : Ticknor and Fields, 1867.

Persistent URL

<https://wellcomecollection.org/works/et47yg6p>

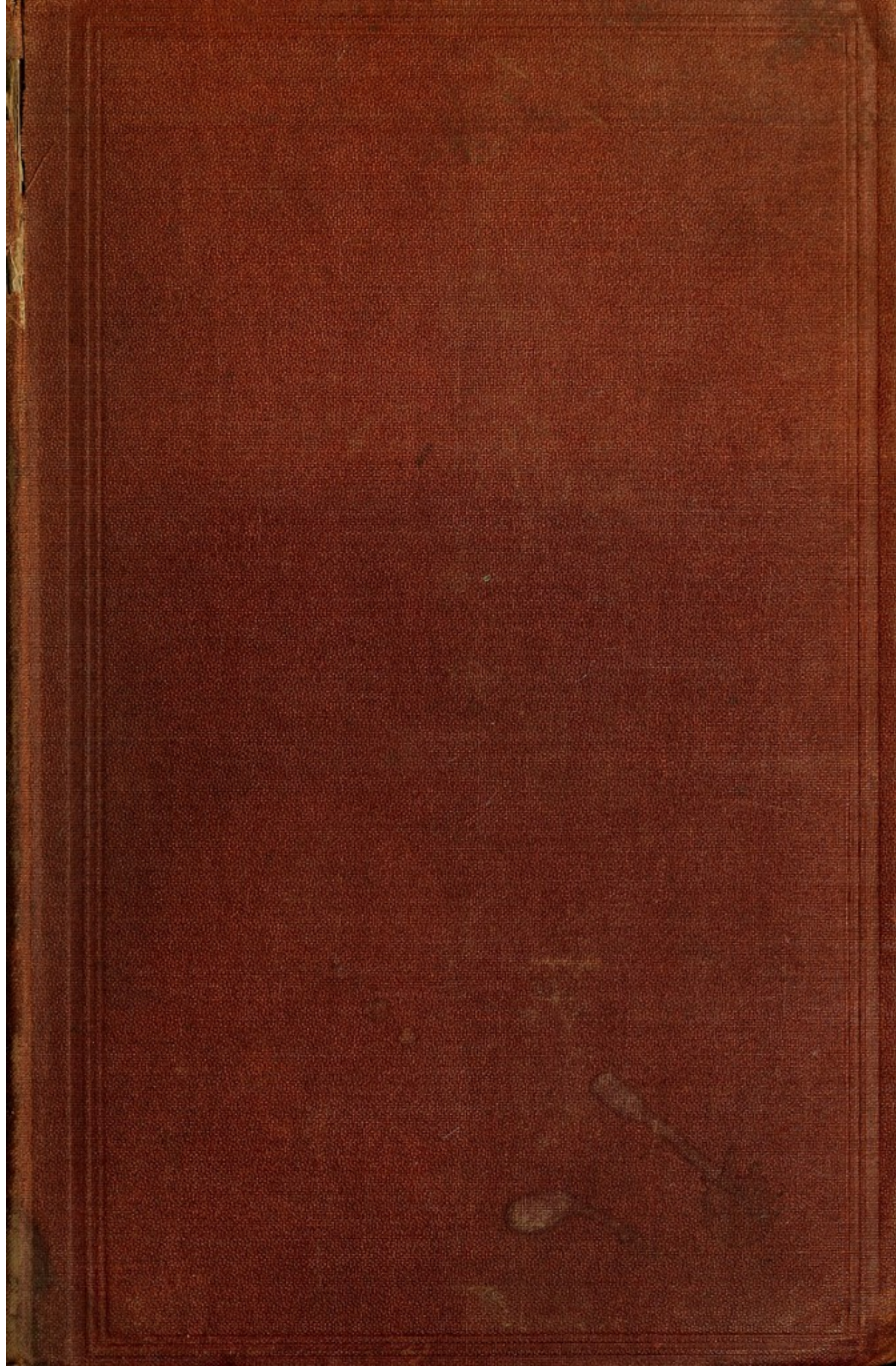
License and attribution

This material has been provided by This material has been provided by the Francis A. Countway Library of Medicine, through the Medical Heritage Library. The original may be consulted at the Francis A. Countway Library of Medicine, Harvard Medical School. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.

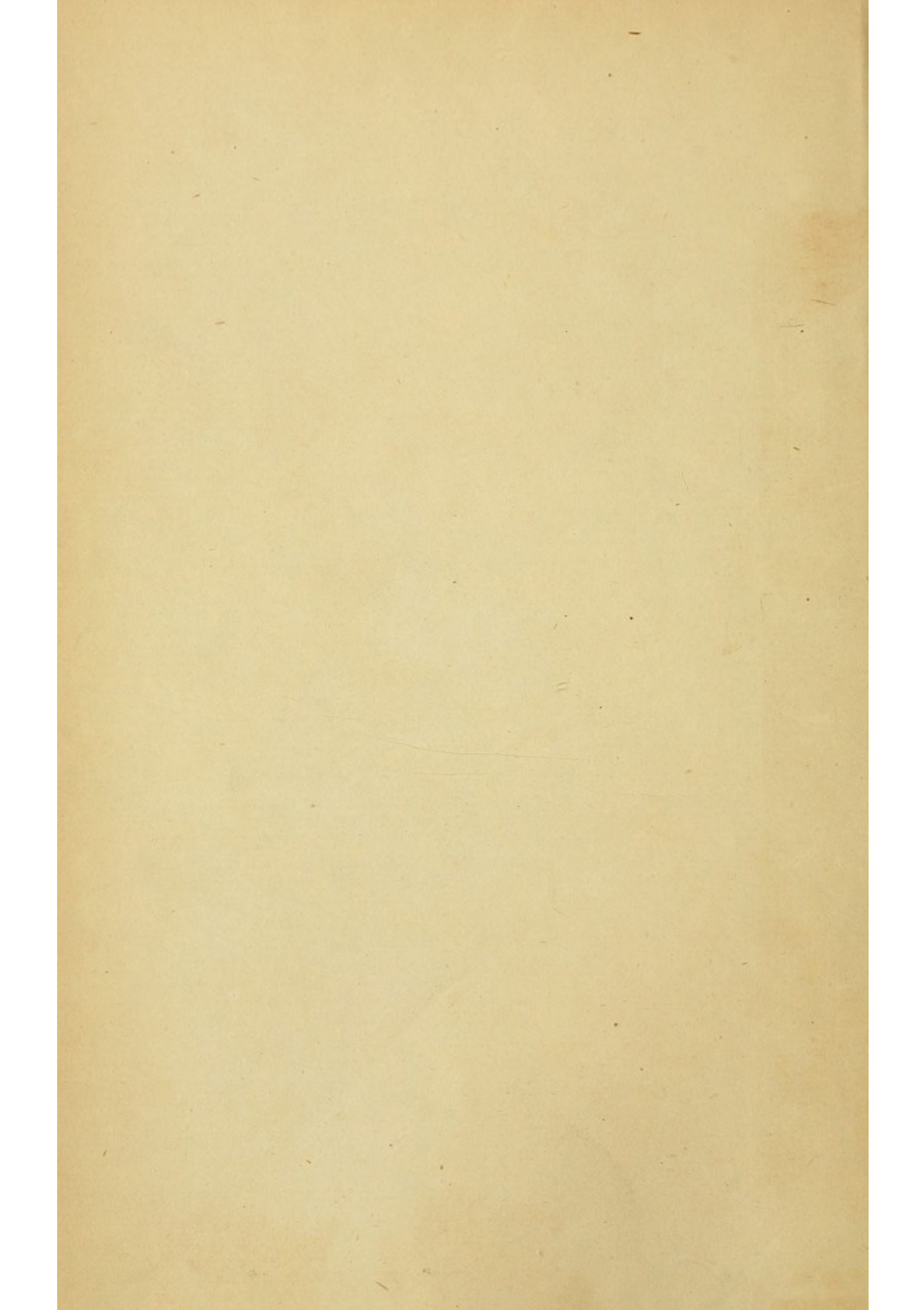


Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>










23

A

161

Geo. L. Shattuck Jan 17, 1906.



Digitized by the Internet Archive
in 2011 with funding from
Open Knowledge Commons and Harvard Medical School



J. H. Bufford's Lady, Boston, Mass.

SURGICAL OBSERVATIONS,
WITH
CASES AND OPERATIONS.

BY
J. MASON WARREN, M.D.,

SURGEON TO THE MASSACHUSETTS GENERAL HOSPITAL; FELLOW OF THE
AMERICAN ACADEMY OF ARTS AND SCIENCES, ETC.



BOSTON:
TICKNOR AND FIELDS.
1867.

23

A

161

Entered according to Act of Congress, in the year 1867, by
J. MASON WARREN,
in the Clerk's Office of the District Court of the District of Massachusetts.

CAMBRIDGE :
PRESS OF JOHN WILSON AND SON.

TO

ROBERT HOOPER, Esq.,

PRESIDENT,

EDWARD WIGGLESWORTH, Esq., VICE-PRESIDENT,

J. THOMAS STEVENSON, Esq., TREASURER,

THOMAS B. HALL, Esq., SECRETARY,

Of the Massachusetts General Hospital;

And to the Trustees,

HENRY B. ROGERS,

JAMES M. BEEBE,

WILLIAM S. BULLARD,

CHARLES H. DALTON,

SAMUEL ELIOT,

GEORGE HIGGINSON,

SAMUEL G. HOWE,

JAMES L. LITTLE,

JOHN LOWELL,

EZRA FARNSWORTH,

CHARLES S. STORROW,

HENRY A. WHITNEY, Esq.'s,

*Under whose wise management the Institution has attained its present importance
to Humanity and Science,*

This Volume

Is inscribed, as a Testimonial of respect and esteem,

BY THE AUTHOR.



THIS volume contains some results of surgical experience, and develops and illustrates what was advanced by the author in an address delivered before the Massachusetts Medical Society, and entitled "Recent Progress in Surgery."

The cases which are cited have been mostly derived from practice in the Massachusetts General Hospital; and some of them have been previously published. Many others might have been given; but it has been thought proper to relate only those of which the histories have been well ascertained.

As a convenient method of classification, the regions of the body have been used; and this order has been kept through the book, except in the last chapters, which relate to Gunshot Wounds, Tumors, and Miscellaneous Cases. It is not proposed in this volume to comprehend every surgical subject, or to enter into much descriptive detail; but simply to indicate the chief points in the cases and operations which are recorded, and to add such remarks and conclusions as have seemed to be pertinent.

PARK STREET, April, 1867.



CONTENTS.

CHAPTER I.

THE HEAD.

	Page
Fractures of the Cranium	1
Trephining for Epilepsy	7
Injuries of the Scalp	15
Concussion of the Brain	16

CHAPTER II.

THE FACE.

Rhinoplastic Operations	18
Operations for the Restoration of the Lower Eyelid	42
Epithelial Cancer and Rodent Ulcer	47
The Eye	55
The Ear	59
Horns	60
Deviation of Septum of Nose	62
Tumors of the Jaw-bone	64
Epulis	70
Cystic Tumors of the Jaw	72
Cancerous Tumors of the Jaw	80
Fibrous Tumors of the Jaw	84
Apparent Tumors of Lower Jaw, secondary to Removal of Cancer of Lip	86
Necrosis of Jaw	88
The Tongue	92
Salivary Calculus	94

CHAPTER III.

THE NECK.

	Page
Foreign Bodies in the Air-passages	96
Croup. Tracheotomy	108
Foreign Bodies in the Œsophagus	112
Stricture of the Œsophagus	114
Tumors in the Œsophagus	116
Removal of Tonsils	119
Fissure of Soft and Hard Palate	126
Harelip	143

CHAPTER IV.

THE CHEST.

Paracentesis Thoracis	146
---------------------------------	-----

CHAPTER V.

THE ABDOMEN.

Hernia. — Strangulated Hernia	152
Radical Cure of Hernia	164
Artificial Anus	168
Iliac Tumor	179

CHAPTER VI.

ANUS.

Hemorrhoids	183
Fissure of the Anus	186
Fistula in Ano	191
Fistulous Opening containing Hair	192
Prolapsus Ani	194
Polypus of the Rectum	195
Imperforate Anus and Rectum	196

CHAPTER VII.

GENITO-URINARY ORGANS.

Stone in the Bladder	204
Stricture of the Urethra, with Retention of Urine	226

	Page
Perineal Section	230
Diseases of the Prostate	240
Wound of the Bladder	241
Vesico-rectal Fistula	242
Cancer of Rectum	243
Indurated Tumor of Penis	245
Tumors of the Spermatic Cord	248
Phimosis	250
Hydrocele	251
Hæmatocele	252
Varicocele	254
Retained Testicle	257

FEMALE GENITO-URINARY ORGANS.

Rupture of the Perinæum	258
Vesico-vaginal Fistula	263
Prolapse of Walls of the Vagina	268
Vascular and Sensitive Tumor of Female Urethra	270
Cancer of Vulva	272
Tumor of Vagina	273
Polypus Uteri	274
Foreign Body in Vagina	276
Occlusion of the Vagina	278
Occlusion of Os Uteri	291
Hypertrophy of Cervix Uteri	294
Ovariectomy	300
Calculus	303
Absence of Vagina and Uterus	306
Hermaphrodism	310

CHAPTER VIII.

THE EXTREMITIES.

Fractures	318
Dislocations	348
Amputations	384
Excision of Joints	409

CHAPTER IX.

ARTERIES AND VEINS.

Aneurismal Tumors, and Ligatures of Arteries	424
Vascular or Erectile Tumor	441

CHAPTER X.

INJURIES AND DISEASES OF NERVES.

Page
465

CHAPTER XI.

TUMORS.

Tumors	479
Tumors in the Parotid Region	488
Leucocythæmia	501
Operations for Cancer (Table)	536

CHAPTER XII.

GUNSHOT WOUNDS.

542

CHAPTER XIII.

MISCELLANEOUS CASES.

Penetrating Wounds of Chest and Abdomen	569
Hip and Spinal Diseases	572
Appendix Vermiformis	575
Hydrophobia	584
Extraction of Needles	590
Injuries of the Os Coccygis	593
Fracture of the Base of Skull	597
Wry Neck	601
Congenital Fusion of Fingers	609

CHAPTER XIV.

ANÆSTHETICS.

Ether and Chloroform	613
Local Anæsthesia	621

ILLUSTRATIONS.

	Page
FRONTISPIECE. — Fungoid Tumor of Forehead. See	483
WOODCUT. — Destruction of Nose, Case XIII.	20
„ Rhinoplastic Operation for, Case XIII.	25
„ Taliacotian Rhinoplasty	33
„ „ „	37
„ Tumor of Œsophagus	117
„ Section of Neck representing the Tumor <i>in situ</i> . . .	118
„ Tonsillotome	123
„ Median Fissure of Hard Palate	140
PLATE I. — Instruments used in Operations for Cleft Palate	142
WOODCUT (after Huguier). — Hypertrophy of Cervix Uteri	298
„ Dislocation of Thigh Downwards	378
PLATE II. — Subclavian Aneurism	425
„ III. — Erectile Tumor of Face and Neck	446
„ IV. — The same after Operation	449
WOODCUT. — Tumor of Head	485
„ Parotid Tumor	495
„ Tumor of Arm	520
PLATE V. — Tumor of Os Frontis, containing Air	576



SURGICAL OBSERVATIONS.

CHAPTER I.

THE HEAD.

FRACTURES OF THE CRANIUM.

It is very frequently observed, that extensive injuries of the head, with comminuted fracture of the skull, do remarkably well, even when there has been laceration of the membranes and considerable loss of cerebral substance. The cases which are, perhaps, most to be dreaded are those in which the depression is limited, and the fragments so firmly locked as to require the operation of trephining for their replacement. In those cases, the results appear to be generally unfavorable. The question of trephining in cases of injury of the skull with depression, both immediately after the accident where no cerebral disturbance is present, and at a later period when epileptic symptoms have come on in consequence of the irritation produced by the depressed piece of bone, is, however, still an open one. Many cases in which there is considerable depression of the skull, and in which not the slightest cerebral disturbance has appeared at the time of the accident, are subject, after the first depression caused by the injury has disappeared, to chronic headaches; and I have seen a number who, a year or more afterwards, have been seized with epileptic convulsions, and have then urgently sought the relief promised by an operation. Extreme doubt must always exist, in these cases, as to the probable success of any operation for elevating the bone after so long a

period, especially as we must almost always be in total ignorance of the extent to which the dura mater and arachnoid membranes are implicated in the original injury.

Patients are often so excessively urgent, however, in their desires for relief, and their lives are rendered so wretched by their sufferings, that it seems fair, in certain cases, to attempt the operation, when we are sure that its danger and uncertainties are fully understood by themselves and their friends. Sometimes, however, a state of partial derangement seems to follow from the effects of the injury; in which case they may insist on an operation where there is little or no chance of benefit.

The diagnosis of fracture of the cranium is occasionally exceedingly difficult, especially in the case of children who have suffered from blows on the head. After these accidents, we very often observe a remarkable phenomenon about the scalp, suggesting a depression of the skull: this appearance is so deceptive that practised surgeons will often be at variance in the opinion whether the skull is depressed or not; a matter sometimes of considerable consequence, if symptoms of compression happen to be present. Sometimes, however, with young children, even if the skull is depressed, it seems after a time to rise up, and resume its natural position. On the other hand, in one instance which I remember, where it was supposed that the appearances of depression were entirely caused by the injury of the scalp and periosteum, and where no symptoms called for an operation, it was found, that at the end of three or four weeks, after all swelling had subsided, a depression really existed.

CASE I. — *Extensive Compound Fracture of the Skull.*
Recovery. — May 18, 1852, I was requested to see a fine, handsome boy, aged 12, who, the night before, had fallen a distance of twenty-five feet, striking on the right parietal bone, and producing an extensive compound comminuted fracture. He had been insensible at first, and in a collapsed state; but had gradually recovered vitality, and, when I saw him, was sensible. Portions of brain escaped from the wound. By the aid of incisions, loose bits of bone were removed, and a large quad-

angular depressed portion — extending up towards the vertex — was elevated. Another portion, driven under the adjacent bones, was removed. The rough edges of bone were smoothed off with Hey's saw. Cold-water dressings were applied to the wound. He was kept under strict diet, very carefully watched, and recovered completely.

Ten years afterwards he entered the army, when he suffered the first inconvenience from his former injury, concussions of cannon producing such a stunning effect upon the brain as to cause vertigo, and ultimately obliged him to quit the service.

CASE II. — *Extensive Fracture of the Base of the Skull, and Rupture of the Opposite Side of the Brain. Death after ten days. Remarkable Absence of Symptoms indicative of so severe an Injury.* — May 18, 1858, a woman was brought into the Hospital, and died after a few days, with very deceptive symptoms. A week before, while reaching out of a third-story window, she lost her balance, and fell, first upon a shed, and thence into the street. She was taken up insensible, but soon recovered herself sufficiently to speak, though incoherently. She was supposed at first to be laboring under the effects of opium, which she was in the habit of taking freely, and a large bit of which was found in her pocket. When brought into the Hospital, a wound was discovered over the right parietal bone; but the finger, being passed in, could detect no fracture. The head was carefully examined in every direction; but no fracture could be found. The patient exhibited signs of concussion, but none of compression, of the brain. There was no vomiting, no dilatation of the pupils, no bleeding from the ear. She was uneasy and restless, like a person under the influence of spirit, to which, and opium, her symptoms were mainly attributed. She gradually improved, and, after a day or two, got out of bed to search the drawer of the table for the opium which had been taken out of her pocket. On the tenth day after the injury, when she seemed much better, and answered the questions of the nurse coherently, a friend made her a visit, and brought her a bit of opium. The same night she suddenly died.

At first, it was very naturally supposed that the opium which she had taken was the cause of the sudden change in her symptoms ; but the post-mortem examination, made by Dr. Ellis, revealed the following very severe injuries of the skull and brain :

An extensive fracture was found at the base of the skull, on the right side, passing behind the auditory foramen, and into the foramen magnum : this was met by another fracture at right angles to it. On raising the dura mater from the opposite side of the brain, a layer of blood was seen spread over the whole of it ; and the middle lobe of the cerebrum was most extensively lacerated.

In this case, nearly all the symptoms seemed to be explicable by supposing concussion combined with a state of delirium tremens, caused by the constant use of narcotics ; and, without an examination after death, the fatal termination would have been attributed to this cause, brought on by the shock from the fall, and assisted by the dose of opium given to her that morning.

CASE III.—*Extensive Fracture of the Base of the Skull, and of the Bones of the Face. Death after ten hours. Previous Injury of the Head, with prolonged Unconsciousness.*—A gentleman 68 years of age, while driving a young horse, and being unable to control him, was seen to jump out of the sleigh in which he was riding, still holding on to the reins. A person seized the horse by the head, and requested the gentleman to let go the reins, which, however, he either could not or would not do. The horse going on, he was brought up violently against a tree, striking the side of his head. Assistance arriving, he gave his name and residence, was taken home, a distance of three miles, all the time making violent muscular movements. He lived twelve hours, depression coming on very suddenly. The effusion of blood under the skin of the face was so great as wholly to obliterate his features. Blood ran freely, also, from the left ear.

On examination, twelve hours after death, it was found that the whole front part of the face had been broken away from the bones of the head, the fracture extending through both

orbits. The fracture was found also to extend through the body of the sphenoid, and another through the petrous portion of the temporal bone, so that a probe passed freely from the external auditory meatus into the cavity of the cranium. The middle lobe of the left cerebral hemisphere was filled with coagulated blood. The amount of injury was greater than I have ever witnessed in a case of fracture of the skull; yet he was able to give his name and address, and lived twelve hours after the receipt of the injury.

This gentleman, thirteen months before, was knocked down by a sled, striking the left side of his head, and breaking the left clavicle near its outer third, with great displacement of the fragments. He remained in a partially unconscious state for three weeks, and would not submit to any treatment for the fractured bone. His left leg he moved with difficulty, either from some blow which he had received upon it, or, as was supposed at the time, from a partial paralysis dependent on the blow on the head. During the greater part of this time, he complained of excessive pain in the head, requiring the constant use of cold applications. He finally completely recovered, without apparent symptoms of having sustained any severe injury. As soon as he would allow it, his arm was kept confined by bandages, for a period of three weeks. At the present examination, we were naturally desirous of investigating the cause of the extraordinarily prolonged cerebral symptoms: no signs, however, could be discovered, either of old fracture or of thickening of the dura mater at the spot where the blow had been received, nor were there any other marks of disease in the immediate investing membranes of the brain. The only appearance of disease was a strong adhesion of a small portion of the right side of the brain to the dura mater, so firm that a part of the brain was torn away in separating it. The clavicle, which for three weeks had had no treatment, and in fact had been violently thrown about in all directions, had firmly united, and was shortened about three-fourths of an inch, but without any projecting angle, — a good commentary on the subsequent necessity for using complicated bandages in the treatment of these injuries.

It may be stated, that, just before the receipt of his fatal injury, he informed me that he could scarcely tell on which side the clavicle had been fractured, return of power in the injured limb having been so complete.

CASE IV. — *Gunshot Fracture of the Occipital Bone without immediate Symptoms. Death after twenty-five days from Abscess of the Brain.* — Dr. Wheeler, of Chelsea, gave me an occipital bone, with a fracture through both tables, caused by a Minié ball. On the inner surface were several fragments which had been driven inwards, with rough spiculæ, encroaching at least half an inch on the cavity of the cranium; on the outside was an indentation corresponding in size and shape to the flattened ball. He also sent the following account of the case:—

"A captain, 35 years of age, belonging to the Thirty-fifth Regiment of Massachusetts Volunteers, in a movement with the Ninth Army Corps, on the Weldon Railroad, near Petersburg, Va., in action on the nineteenth day of August (1864), received a wound of the scalp upon the back of the head, by a rifle-ball striking the occipital bone near the apex, and just within the lambdoidal suture of the right side. The immediate effect of the concussion caused him to fall, with a momentary faintness and loss of his eyesight; but his consciousness was retained. In a few moments he was able to get up, and walked to the rear, where the ball was picked out from its bed under the scalp. No symptoms of compression were present, no fracture was then suspected, and the injury was recorded as a flesh wound. He was transferred to City Point, Va., and from thence to a general Hospital near New-York City, where he remained, very comfortable, some eight or ten days. He was then furloughed, and arrived home (near Boston) on the first day of September following. He complained but little of his head, but said that it felt heavy at times, and that his eyesight was not quite as good as usual. These symptoms did not confine him at home: he walked out, called to see his friends, and also attended in person to some business matters. The wound in the scalp was suppurating moderately, and was looking well. The day he arrived home, a fissure and depression of bone were discovered to

exist; but, as no symptoms of compression or cerebral disturbance were present, it was thought that surgical interference was hardly called for. But about the 7th of September, or some eighteen days after the date of the injury, he complained of a chill, which was followed by fever and pain in the back of the head; and, in a few hours, slight delirium came on. The delirium, heat, and other symptoms became more severe from day to day, finally ending in profound coma, with slight convulsions. He died on the 15th of September, just twenty-five days after the injury."

An autopsy exhibited a fracture of the occipital bone. In addition to the appearances mentioned above, "the dura mater gave signs of active inflammation in a circular spot of about two inches in diameter. It was not lacerated, was quite dark in color, and readily separated from the bone. Just beneath this portion of the membrane was found a well-defined abscess, containing about two ounces of pus, formed in the substance of the brain.

"The history of this case, with but a glance at the bony specimen, will at once suggest the trephine and its early use as the best means to ward off inflammation and its consequences."

TREPHINING FOR EPILEPSY.

CASE V. — *Operations on the Head for Epilepsy following Injury of the Skull. Trephining for an old Depression causing Convulsions and Idiocy.* — This girl, 10 years of age, was struck in infancy upon the head; and, although the corporeal faculties had developed normally, there had been little, if any, manifestation of intelligence. The child recognized imperfectly her parents; was a voracious eater; excessively strong, wild, and unmanageable, at times so violent that it was impossible to restrain her. She was unable to articulate, but would frequently run through the house, uttering a kind of howl, and leaping to the distance of many feet like a wild beast. She was also subject to the most distressing convulsions. Under these circumstances she was brought to me, with the earnest request that I would endeavor to do something for her relief.

On examination, there was found, extending across the head, just behind the coronal suture, a longitudinal depression, three to four inches in length by one in width. I suggested to the parents—giving them to fully understand its danger—the removal of the depressed portion, as the only remedy which occurred to me. This being submitted to a consultation of the surgeons of the Hospital, it was determined to advise it, considering the desperate nature of the case. When brought into the amphitheatre, the patient rushed in with her head down, hardly restrained by the strength of two men. After she had been brought under the influence of ether, the necessary incisions were made through the integuments, the bone was cut through with two crowns of the trephine, and the openings joined by cutting out the intermediate piece with a Hey's saw.

For the first six days she did well; but died, on the ninth, from a bleeding from the longitudinal sinus, which ruptured after some sudden and violent movement made by the patient in bed. The father thought there was an appreciable increase of the amount of intelligence after the operation; and it was obvious to every one, that she took cognizance of persons and things about her in a way she had never done before.

I partly attribute the failure of this operation to my following the suggestion of a bystander, and sewing up the wound, instead of allowing the flap to fall down, and adhere to the parts beneath. The consequence was, that pus collected in the cavity formed by the scalp, causing decomposition of the dura mater, which assisted in eroding the textures beneath.

CASE VI. — *Trephining for Depression of the Skull causing Epilepsy.* — J. C., 21 years of age, applied to me, Oct. 25, 1850, and gave the following account of himself. Fourteen years before, he had fallen against a post, and received a severe blow on the left side of his head. His scalp was cut open, but there was no perceptible fracture of the skull. Within a year after the accident, he was attacked with epileptic fits, to which he was subsequently subject, at intervals of one or two months. The attacks were followed by pain and drowsiness. The pain was felt chiefly at the point where the in-

jury was received, and also over the right orbit. His memory was impaired; he was erratic, impetuous, and unmanageable. The bone, at the seat of the injury, appeared thickened and sensitive. Finding that he was becoming a burden to himself, and in danger of losing his mind, he applied to me to perform the operation of trephining, having informed himself on all points with regard to it. Oct. 26, 1850, being etherized, his scalp was raised by a V-shaped incision over the injured part; and a trephine, one inch in diameter, was applied over the suture between the frontal and parietal bones. On raising the bone, the frontal was found to be more than three times as thick as the parietal. A simple water dressing was applied to the wound. Oct. 27, the day following the operation, the Hospital record states that he had severe vomiting; his pulse was ninety-six. On the 28th, he complained of headache, but had some sleep through the night. The next week or two, he had more or less pain in the head, but gradually improved. Nov. 28th, he seemed quite well, and the incision made by the operation was healed. He remained under my cognizance a month longer and was finally discharged Dec. 24th, having had no epileptic attack during the two months that he remained in the Hospital; and his moral and physical condition otherwise materially improved.

I heard from him some months afterwards, and he made a good report. He subsequently, however, as I understood, fell into irregular habits, and died ultimately with a cerebral attack.

CASE VII. — *Operation for Depression of the Skull caused by a red-hot Poker passing through the Bones, and penetrating the Brain.* — A fine-looking young man, 22 years of age, a Nova Scotian by birth, applied to me in December, 1857, on account of severe epileptic fits, caused by a depression of the skull from an injury he had received three years before. His account of the circumstance was this: He was by trade a blacksmith; and, while engaged at work, playfully threw some article at a fellow-workman near him. This person returned it, by throwing at him a red-hot poker, which he had in his hand. The poker struck him on the frontal bone, just above the orbit:

it passed through the bone, and entered about three inches into the cerebral substance. He immediately seized the instrument himself, and drew it out by main force. There was but little bleeding from the wound. He did not at the moment become insensible; but, an hour afterwards, he fell into a comatose state, in which he remained for a part of the rest of the day. He was very carefully attended by Dr. Hooker, of East Cambridge; and in about three months the wound was sufficiently well, and his health so far restored as to allow him to resume his business.

About four months after the injury, he was seized with a severe epileptic convulsion; and these attacks have followed pretty regularly since, at intervals of three months. He says he falls very suddenly without the slightest warning, and sometimes injures himself severely. He lately fell backwards upon his anvil, striking the back part of his head, and cutting the scalp, behind the ear, down to the bone. The convulsions, of late, have increased in frequency; and he feared lest his mind should become affected by them. He was also apprehensive that he might some day, while at work, fall into the fire, and burn or seriously injure himself. Under these circumstances, both he and his friends were very urgent to have an operation performed.

On an examination of his head, a depressed portion of skull, of the size of half a dollar, was found just over the right internal angular process, partly implicating the frontal sinus. In the centre of this depression the skull was deficient, and a thick strong cicatrix indicated the point at which the dura mater was adherent to the integument. The pulsations of the brain were here distinctly visible.

After seeing this patient once or twice, and carefully investigating his case, I finally advised an operation, fully informing him of the hazard of it. He entered the Hospital; and the surgeons, in consultation, having concurred in the propriety of my opinion, the operation was performed on Dec. 24th.

The principal difficulty consisted in fixing the trephine so as to make it take hold of the skull, on account of the impossibility of using the pin, from the bony deficiency in the centre of the de-

pression. To meet this difficulty, a bit of thick leather, which had been previously prepared with a hole in it to receive the trephine, was fixed to the head; but this, in practice, was found not to answer its intended purpose. After considerable labor, the trephine was made to take hold; and the rest of the operation was done with a moderate degree of facility. The portion of bone removed entire comprised about half a circle; the anterior part, being that which formed the roof of the frontal sinus, came away in bits. From the interior of the portion removed, a sharp spine projected, which was imbedded in the brain. The membranes of the brain, where they penetrated the bone and adhered to the scalp, were carefully separated from their attachment to the bone by means of a probe; being at one point so excessively thin and delicate as to have hardly the consistency of blotting-paper. Here an inevitable tear took place, with the escape of a very minute quantity of limpid fluid from within. This was the only unsatisfactory occurrence in the course of the operation. The wound was very lightly dressed, and no sutures used.

In the afternoon, the patient was sitting up in bed, quite bright, and seemed scarcely affected by the operation. On the following day, he said he was doing well, and had passed a good night. On the third day, he was not so well: his face was flushed, pulse ninety, skin hot; and he seemed indisposed to talk. There were evident signs of inflammation of the membranes of the brain. An active cathartic was administered, and cold applications were made to the head. On Dec. 27th, the third day after the operation, I found him almost insensible; pupils not dilated; pulse one hundred and nineteen. Sixteen ounces of blood were taken from him. The symptoms had increased in severity by the following day; and, in the course of it, he died.

By permission of his friends, an examination of the body was made by Dr. Ellis, on the day after his decease. The whole surface of the arachnoid, on the side affected, was covered with pus; and some was found underneath that membrane. At the point of injury, extending two inches into the brain, there was an organized clot still retaining somewhat of its color, and

showing distinctly the course pursued by the red-hot iron three years before. The inner surface of the skull was smooth; and adherent to the edges of it (where it had been divided by the saw) were two small, flat, ivory-looking pieces of bone, about the circumference of a pea. These bits had probably been originally detached by the poker, but were now firmly adherent to the bone.

Remarks.—In view of the great difficulty of fixing the trephine in this operation, it occurred to me afterwards, whether any other plan could have offered better chances for despatch. The only one which suggested itself was to have made a number of holes around the circumferences of the opening in the skull, and connect these different perforations by a small saw.

The non-success of the operation must be attributed to the perforation of the membranes, at the point of their intimate connection with the aperture in the bone, where they passed through to form a union with the scalp; and this, apparently, no care could have avoided.

CASE VIII. — *Case of Depression of the Internal Table of the Skull, causing Epilepsy.*—M. N., 18 years of age, entered the Hospital in April, 1865, for the purpose of having an operation done for trephining the skull, on account of a depression causing epilepsy. He stated that, six years before, he had been kicked in the head by a horse, that his skull had been fractured and depressed, and that he had been unconscious for several weeks. There is some doubt in regard to this part of his account, as he was seen by practised surgeons, and no operation was thought necessary. He recovered from the accident in about four months, and returned to work. He remained well until March, 1864, when he was seized with an epileptic fit, and remained unconscious for fifteen minutes. He had two similar attacks in May, one in December, and one in February, 1865. Since the 1st of January, 1865, he had suffered from general weakness, loss of appetite, tenderness in the epigastrium; his speech was stuttering; and he complained of a constant ticking sound in his head. An examination of his head disclosed an apparent extensive depression of the parietal bone, above and

behind the left ear. Although he was urgent for an operation, and, on a consultation, it was decided that an operation was appropriate, I was very reluctant to proceed to it, from the great uncertainty attending operations for trephining in these cases, and therefore decided first to try the effects of treatment.

He was kept quiet, dieted, had a seton put in the back of his neck, and took ten grains of bromide of potassium twice a day. At the end of five or six weeks, an extensive eruption of acne appeared on the face, and the bromide was discontinued. He remained in the Hospital three weeks, under treatment, and, during that time, had no convulsions: it was therefore decided that he should go into the country for the summer, and continue the treatment. Throughout the summer, he had but a single convulsion; but that lasted an hour and a half. He entered the Hospital again in January, 1866, insisting on an operation. Since his last attack, his symptoms had all been aggravated; his head "felt as if it would split open," and he was almost afraid to lie down, on account of the aggravation of this sensation; the stomach was much distended with flatus, and he had nausea after eating.

The scalp having been shaved, the vacuity in the bones became more evident, and a pulsation was detected as if coming from the brain: this was not constant, but was most observed principally when he rose up suddenly. On deep pressure, a resistance was felt; and it was not possible to say, with certainty, that any part of the skull was deficient at this spot.

The patient, having been properly prepared for the operation by a purgative the day before, and taken nothing but liquid for breakfast, was etherized. A circular incision, describing two-thirds of a circle, was made through the scalp, with the convexity extending below the depression; the flap, being dissected up, uncovered a space about three inches in diameter. It was at once found, on raising the flap, and scraping up the periosteum at the edge of the depression, that the bone was completely deficient at that point, which was filled up with the membranes of the brain, through which the pulsations of that organ were distinctly observed. The external table of the skull did not seem depressed, and it was impossible to say what had become of the

deficient fragments. A small quantity of the arachnoid fluid could be seen trickling out, exactly from what point could not be detected. As no trephining operation seemed indicated, and as it was impossible to proceed without opening the cerebral coverings, it was decided to desist from farther proceedings. The flap was accordingly brought down, and secured by sutures. In the afternoon, he had recovered from the ether, expressed himself relieved, and the following day was in a very satisfactory condition. On the 26th of January, two days after the operation, he began to be confused in his mind: his strength seemed to fail, and he could not answer questions. On the 27th, he had an epileptic fit, lasting half an hour. On the 28th, he had a continued succession of fits; the left pupil was dilated, and the urine passed involuntarily; pulse one hundred and twenty; the right leg was paralyzed. On the 29th, he died about 2½, P.M.

On post-mortem examination of the head, there was an extensive inflammatory deposit between the arachnoid and pia mater; the veins of the brain, on the left side, were greatly engorged. The effects of the accident on the skull were remarkable: for a space of three inches or more beneath the opening in the skull, the internal table was depressed nearly three-quarters of an inch below the level of the external table, this depression extending off on each side for some distance; the dura mater and arachnoid projected through this fissure, and were attached around the margin of the external opening, which, at some parts, was simply filled with the arachnoid alone; through this, at one point, was a minute aperture, caused very possibly by the dissection of the scalp, which had been made at the time of the operation. From the condition of the skull, no operation, of course, which could have afforded him relief, would have been practicable. The case is an instance of the entire uncertainty which we must be prepared to encounter when we proceed to an operation of this description.

Cases of Trephining for Epilepsy occurring at the Massachusetts General Hospital.

DATE.	SEX.	AGE.	CAUSE.	RESULT.	TIME.
Feb. 22, 1832	F.	23	Depression with Epilepsy	Cured	4 months
Sept. 19, 1842	M.	26	Epilepsy	Died	8 weeks
May 27, 1838	M.	26	Depression with Epilepsy	Cured	9½ weeks
Oct. 25, 1850	M.	21	Epilepsy	Rel'd	2 months
Dec. 19, 1850	F.	28	Epilepsy	Cured	3½ months
Dec. 24, 1857	M.	22	Depression with Epilepsy	Died	4 days
Aug. 18, 1860	M.	25	Epilepsy after Fracture	Died	10 days
Jan. 12, 1861	M.	37	Epilepsy after Fracture	Died	5½ weeks
Aug. 31, 1863	M.	25	Depression with Epilepsy	Rel'd	3 weeks
Jan. — 1866	M.	21	Depression with Epilepsy	Died	6 days

RECAPITULATION.

Cured	3
Relieved	2
Died	5
Whole number of cases	10

INJURIES OF THE SCALP.

The following cases of extensive laceration of the scalp, with almost total denudation of the bones of the head, are reported as showing how promptly recovery may take place after such injuries, even under circumstances seemingly most unfavorable.

CASE IX. — A boy aged 12 was knocked over by a wagon, the wheel passing over his head, removing the whole scalp, from the top of his head, commencing at the occiput, and carrying it down over his eyes. When I saw him, about an hour afterwards, the surface of the inverted scalp and the denuded skull were still covered with dirt and gravel, although a partial attempt had been made to clean it by washing. After cleansing it still farther, the skin was replaced, and secured by a great number of sutures. The whole united by the first intention, and with scarcely any suppuration or deformity.

CASE X. — A man was brought into the Massachusetts General Hospital, and came under my care, who had fallen from the tongue of his cart while asleep, the front fore-wheel of which had passed over his head, tearing and rolling up the entire scalp, and leaving it covering his face.

After being thoroughly cleaned by having warm water squeezed over it, and the sponge being used as little as possible, it was replaced and secured by a large number of sutures.

He recovered rapidly, without any suppuration, and with almost complete union by the first intention.

CONCUSSION OF THE BRAIN.

CASE XI. — *Concussion of the Brain, with complete Deafness, and injury of Scalp.* — A gentleman 60 years old was thrown from a chaise, in June, 1861, striking his head, tearing the scalp almost completely off, and producing a concussion of the brain, under which he remained insensible one or two weeks. He was afterwards informed by his medical attendant, that there had been some bleeding from the ears. The scalp was replaced, and united perfectly in about two months. He has never been able to hear the slightest sound since. He speaks well, however, and with a good intonation of voice. He is a clergyman, and is able to preach.

In February, 1862, he applied to me for advice. On examining the ears, the drum of the right one was found to be uninjured; the left was perforated, and red and fleshy in appearance, with a purulent discharge from its surface. I informed him, that but little benefit was to be expected from treatment.

CASE XII. — The following case of concussion is an instance of severe symptoms coming on a week after the injury; showing the importance of care in the management of persons who have received severe blows on the head, though no symptoms, for the moment, are present: —

A man aged 35 was brought to the Hospital, April 9, 1864, having had, the day before, slight convulsions, drowsiness, and an unwillingness to talk. A week before, he had fallen

out of his wagon, striking his head on the pavement. For six days no inconvenience followed the accident, and he did his work as usual. He walked from his house to the Hospital with the assistance of his wife. His appearance was sleepy. He complained of pain in the back of his head, where an elevation of the cranium was felt, which might be normal, — an unusual development of the occipital protuberance. Pressure upon this part caused him to throw his arms about, and complain of pain. His pupils were contracted; pulse slow.

April 10th, he was lying on his back, with his eyes closed. His pupils were contracted, and the urine was passed involuntarily. He was ordered a dose, ten grains each, of calomel and jalap. On the 11th, the medicine had operated freely; he was more sensible, and answered questions; urine as before. On the 12th, he was again drowsy, and could not be roused to answer questions; pulse fifty-two, small. April 13th, still drowsy. He was ordered an injection of weak mustard and water, and a blister applied to the back of his neck. April 14th, said he felt a great deal better. April 23d, he was somewhat stupid; pain in his head; pulse sixty-six. On the 28th, he was up and dressed, and his mind was clearer, and speech was much improved. April 29th, he was discharged, — well.

CHAPTER II.

THE FACE.

RHINOPLASTIC OPERATIONS.

THE operation of rhinoplasty is of very ancient date. It had, however, for various reasons, fallen into most unmerited disrepute until between thirty and forty years since, when it was revived in Europe by Graefe, Dieffenbach, and Labat on the continent, and Liston in Great Britain.

In the ancient operations of this kind, the lost organ was restored at the expense of the integuments in its immediate neighborhood. Advantage being taken of the extensibility of the skin of the cheeks, the integuments were dissected up on both sides of the nasal fossa, brought forward, and united in the centre by points of the interrupted suture. If the extensibility of the integuments was not sufficiently great, incisions were made in front of the ears, so as to diminish the tension of the skin: the wounds thus made were afterwards allowed to fill up by granulation. This operation, however, did not restore the form of the lost organ; and the only advantage gained was a flap of skin to cover the existing deformity. The operation, which was afterwards adopted, and which now bears the name of the author, was that of Taliacotius. In this operation, it was required that the arm should be confined in contact with the face for ten or fifteen days, or until union had taken place. The disadvantages of this method are at once manifest: the length of time during which it was necessary to keep the limb in this painful condition, sufficient in some cases to produce partial paralysis, and the danger that ensued in the too early separation of the transplanted skin from its source of nutrition, were, of themselves, reasons of sufficient weight to cause it to fall into disuse.

The operation which has attained the most celebrity, and which has been most frequently practised in France and England, is that which goes by the name of the Indian method, in which the flap is taken from the forehead.

It was my good fortune to witness a very large number of operations by the Indian method by the distinguished M. Dieffenbach, of Berlin, at the time of his visit to Paris in 1834.

Soon after my return home, I had an opportunity of performing several operations for the restoration of the nose; employing, in one case, the Taliacotian or Italian method; and, in another case, taking the requisite material from the fore-arm. The Indian method I have very frequently employed; in most cases, with excellent results. The scar left on the forehead is much less conspicuous than might be expected, and the great suffering to the patient which results from the confinement of the arm to the head in the Italian method is avoided. The principal inconvenience which I have observed in these operations depends upon the fact, that the material for the septum, and often for the tip of the nose, must be taken from the scalp. The consequence is, that the hair continues to grow upon these parts; requiring frequent shaving, or extraction with forceps. Depilatories I have often tried, but have never found that they produce more than a transient effect.

The following and some of the succeeding cases are the first performed in America with success, and probably gave the impetus to the introduction of this class of operations. The Taliacotian operation, as performed by the discoverer, of transplanting a portion of the skin from another part of the body, had not been adopted by modern European surgeons; so that the cases of that operation mentioned below were probably the only ones that had been successfully done for a number of years:—

CASE XIII. — *Rhinoplastic Operation.* — A young man, 28 years of age, in the spring of 1834 received a blow on the nose, which dislocated the cartilage to the left side. This was followed by brief inflammatory action. As he was out of town, and at a distance from medical advice, nothing was done to replace the cartilage, which remained permanently displaced.

In the following spring, a red spot appeared on the right cheek below the eye, which very soon increased in size; the inflammation gradually spread, attacked the lip, and then extended to the nose, which became red, swollen, and finally ulcerated.

It will be unnecessary to go further into the details of the case: it is sufficient to say, that, in the course of eighteen



months, all the textures of the nose were successively attacked, and finally destroyed. Subsequently, cicatrization took place; leaving the patient in the state in which I saw him, six months after his recovery from the disease.

At this period, having accidentally come across a description of the Taliacotian operation in an old magazine, he was desirous of know-

ing whether any thing of a similar kind could be done to remedy his frightful deformity. The following was his state as he appeared on the first examination:—

The nose, as already stated, was completely destroyed, leaving in the place it originally occupied an opening about an inch in diameter, bordered by a firm cicatrice; the septum of the nostrils was gone, and the two nasal cavities thrown into one; externally a small cicatrix descended from the lower and left edge of this opening to the angle of the mouth. In the course

of the disease the four front teeth had been lost, which, together with the absorption of the alveolar processes, had caused the upper lip to sink much below the level of the lower one. An opening existed between the lip and upper jaw, through which a probe might be passed from the mouth into the nasal cavities. The sense of smell was quite lost; and he was subject to a flow of tears over the face, arising undoubtedly from the too sudden contact of the air with the lachrymal ducts.

A thorough examination of his case having been made, and finding there was no obstacle to the possibility of a successful operation, its difficulties were distinctly stated to him, — the improbability of its succeeding so as to restore the organ in such a manner that the deformity should not be known; that the new nose might become very much flattened, and, perhaps, on the appearance of cold weather, gangrene might take place; and, finally, that even his life might be endangered by it. I felt it my duty to state the case plainly, having seen all these accidents occur abroad from the operation; in two cases death being the consequence, from severe erysipelatous inflammation of the scalp.

Notwithstanding all these objections, he decided to incur any risk which would give him the least chance of having the deformity under which he labored obviated. It was thought expedient to delay the operation a few weeks, in order to prepare him by a course of diet and regimen. At the end of six weeks, as he still persisted in the determination of having it performed, preparations were made to do it at once, since, on account of the approach of cold weather, no time was to be spared.

The preparations having been made, the operation was performed on the 7th of September. A piece of pasteboard, cut in the shape of the letter V, that is, of a triangular form, and with a projection from its base corresponding to the columna of the nose, was placed upon the forehead, and a trace made around it with the nitrate of silver, which was used in preference to ink, as recommended by Lisfranc, in order that it might not be effaced by the blood. A trace was also made around the opening of the nasal fossa, at the points where it would be necessary to remove the integuments for planting the new skin

taken from the forehead. This was done on the night previous, in order to prevent any undue delay on the day of the operation.

All unnecessary articles of clothing having been removed, the patient was placed on a table in a recumbent position, his face towards the window, and the operator behind, so as to have the full command of the head. The traces made by the nitrate of silver were about two-thirds of an inch apart between the eyebrows; each side of the triangular portion of skin was three inches and a quarter in length, with a base of three and a half inches; and the projection for the columna of the nose, which was to be taken entirely from the scalp, previously shaved, was an inch and a half long, and two-thirds of an inch wide.

The head being firmly supported by two assistants, the incision was commenced between the eyebrows, and the flap of skin dissected up so as to isolate it entirely from the skin of the forehead, except where, for the purpose of nutrition, it was left adherent at the root of the nose. The incision on the left side, between the eyebrows, was extended a little farther down than on the right, to facilitate the twisting of the flap. This included the skin, subcutaneous cellular tissue, and a portion of the occipito-frontalis muscle; care being taken not to raise the periosteum, from fear of necrosis.

The flap thus dissected, and twisted round to the left side, was carefully wrapped in a compress of linen cloth; and, before the operation was proceeded with, attention was given to diminishing the large wound made in the scalp. Little hemorrhage had taken place; and the temporal arteries, which had been cut, very soon retracted, and ceased bleeding. The angles of the wound were first brought together by the twisted suture, two pins being employed on either side. Its edges between the eyebrows were also approximated in a similar manner: by this means the wound in the forehead was diminished at once to less than half its original size; it was still farther reduced by the use of a few strips of adhesive plaster, and a little scraped lint filled up the remainder of the wound. Lint spread with cerate was applied over the whole surface, a compress, and the whole secured by a bandage round the head.

The next object was to fix the borrowed skin in its place. In order to do this, it was necessary to freshen the borders around the opening of the nasal fossa, the traces of which, as stated above, had been previously made with nitrate of silver. For this purpose, a short narrow knife, somewhat similar to a cataract knife, was used, and a strip of integument, a third of an inch in breadth, removed, including all that portion which had been indurated during the cicatrization of the ulcerations. The knife was also passed between the lip and upper jaw, in which existed, as before stated, an opening large enough to pass a probe; and the adhesions between the two, for the space of an inch, entirely cut away. This was done for the double purpose of giving the columna of the nose a more deep and firm adhesion, and, in the inflammation which would subsequently ensue, to close up the unnatural communication between the mouth and nasal cavity.

The flap was now brought down into its place, its angles a little rounded with the scissors, the better to simulate the alae of the nose, and the whole secured in its place by pins, and points of the interrupted suture. From that portion of the skin which was to form the columna of the nose, the epidermic side was pared, so that it might form an adhesion, not only underneath to the jaw, but on its sides, to the quadrangular wound made for it in the upper lip.

Scraped lint was now placed under the ends of the pins, and a strip of oiled lint introduced into each nostril, to prevent adhesion; another strip was placed upon the nose to preserve its temperature. The dressings were secured by a band of adhesive plaster, fixed to the forehead above, and partially divided in the middle, so that it might descend on each side of the nose to the lip.

During the whole of this long and painful operation, the patient kept up his courage, and not a cry was uttered, nor the least struggle made that could at all impede the motions of the operator. Not much blood was lost, and his strength was so little exhausted that he was able to run up stairs to his chamber. He was ordered to go to bed immediately, to keep perfectly quiet, and a watcher left with him, who had directions, in case

of his falling asleep, to prevent him from either rolling over on his side, or raising his hand to the nose, so as to derange the dressing; also, to wake him immediately should he breathe through the nose. To have arrow-root, or gruel and lemonade, for nourishment.

On visiting him in the afternoon, he was found comfortable; the new nose was warm, and had bled a little from the edges which formed the nostrils, both showing that the circulation was not at all impeded.

Sept. 10th. Passed a good night, slept well, pulse seventy-nine, complains of no pain; the nose of about the natural temperature. A piece of cork was confined between the teeth, so as to keep the mouth open, and prevent him from breathing through the nose during sleep. The introduction of the cork proved successful.

12th. The first dressing took place four days after the operation, and the following was found to be the state of the parts:—

The dressings on the forehead, after being well soaked, were first removed. The angles of the wound were found to have united throughout, so that two of the pins were at once dispensed with. Union had also taken place in its lower part, just above and between the eyebrows: the remainder of the wound, that is, its central part, in which union by the first intention could not take place, was suppurating well, and filled with healthy granulations.

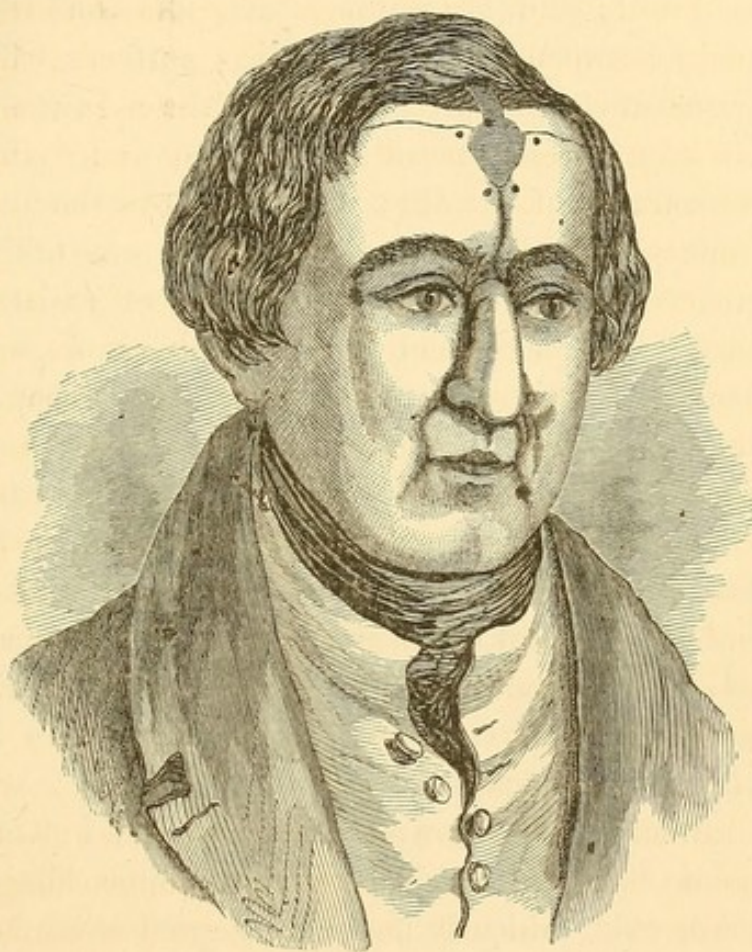
Upon removing the lint from the nose, it was found that entire union had taken place on both sides. The alæ and the lower edges could not easily be seen without making use of too much violence. The columna was curved inwards, and the sutures concealed. The nose was of the natural color and temperature, and the circulation through it seemed uninterrupted.

Two strips of lint, dipped in oil, were laid over the cicatrix on each side of the nose, and no other dressings used. The patient was allowed to sit up a little, and to take any article of liquid food he might fancy.

On the 13th he was quite as well, with the exception of a little œdema of the upper eyelids, arising, undoubtedly, from the pressure of the bandages and other dressings on the forehead.

One of the pins was removed from the forehead on the 13th; and another, the only remaining one, on the following day. The dossils of lint which had been placed in the nostrils still remained there, firmly caked in. These were not removed until the 16th, when their places were supplied by two pieces of hollow sound.

On the 14th, a quantity of hair began to appear on that portion of the skin forming the columna of the nose, which, from time to time, required to be removed. He was put upon a nourishing diet, with the caution to use the jaws as little as possible. He stated that occasionally, when he swallowed, he had a sensation as though he would "swallow his nose."



15th. The remaining pins were removed from the side of the nose, and the two sutures which confined the alæ;

and on the 17th, ten days after the operation, the two ligatures which confined the columna in its place were also removed.

At this period, the state of the parts was as follows: The wound in the forehead had diminished to a third its original size; and the small triangular space which remained, together with that portion of the scalp from which the columna of the nose had been taken, was filled with healthy granulations. From the wound to the root of the nose was a linear cicatrix nearly

two inches in length, and continuous with the cicatrix on the left side. Adhesion of the integuments had taken place on both sides of the nose: at the right ala, however, the union was not quite so perfect as at the left; that is to say, the whole thickness of the skin did not appear to have united. To assist the union, the skin of the face which lay under it was slightly scarified with the point of a knife.

The columna was a little curved, and its edges had retracted inwards upon themselves. The inside of the nose was suppurating well; and, at its upper part, adhesion seemed to have taken place between the two bleeding surfaces which had been opposed to each other. The tip of the nose was well defined, and its edges were curved inwards, so as to simulate the natural appearance of the alæ; and just above the alæ, apparently from atmospheric pressure, a depression was taking place, forming their superior boundary. This was assisted by the patient making an occasional pressure with his fingers at these points. He felt well, had a good appetite, and sat up all day. He breathed freely through the tubes placed in the nostrils, which required to be removed daily, in order to clear out obstructions.

At the end of a month, the wound in the forehead had contracted to about a quarter of its original size; adhesion of the nose was perfect at all points; the nostrils were regularly rounded, and simulated well the natural contour; the tip of the nose was well preserved, and the curve from its root to the end of the organ was regular.

In six weeks, he was able to go out; but, as the weather became cold, he was advised to confine himself to the house, since cold evidently had a very great effect in retarding cicatrization. By reference to the second figure, a pretty correct idea will be formed of the state of things six weeks after the operation.

At the end of two months, it was thought time to proceed to the second operation, which was required to remove the twist at the root of the nose. Underneath the pedicle which connected the nose with the forehead, a small portion of sound skin remained; and, of course, no adhesion had taken place between this portion and the pedicle lying over it. The method

usually adopted by operators has been to cut the pedicle, after the nose has united sufficiently to justify its separation from the source of nutrition, and to fix it down at the root of the nose, in a transverse incision made for it at that point.

To this method there are some serious objections. First, the danger of inflammation in separating the pedicle; second, of sloughing of the organ, on dividing its vascular connections; and, lastly, the very perceptible transverse cicatrix which remains. The course resorted to in the present case is liable to none of these objections, except perhaps the first one, in which the danger is much diminished.

This was as follows: An incision was made, commencing near the internal angle of the eye, and extending to that part of the base of the nose where adhesion had not taken place; a corresponding incision was also made on the pedicle. The skin being dissected up, the wrinkle in the integument at the upper angle of the wound was removed: the edges were then brought together by sutures. Union took place, throughout, by the first intention.

Four months after the operation, he was entirely well. There was no secretion from the nostrils; and, on looking into those cavities, a new skin was found to line them throughout. The nose itself gradually contracted, so that, first by the shrinking of the integuments, and subsequently from suppuration, it decreased to about two-thirds the size of the flap which was taken from the forehead. Contraction also took place in its longitudinal axis. The nose was much improved, when the four front teeth, which had been lost, were replaced by the dentist, which brought out the under lip, and at the same time raised the tip of the organ. The cicatrix in the forehead became very small, and gradually assumed the color of the surrounding integuments; the scalp from which the columna was taken was lost in the hair; the nose was quite firm, of a good form, and the cicatrix on each side scarcely perceptible. At the root, on the left side, and at that portion which formed the pedicle, a small fissure remained, which was concealed by a strip of court-plaster.

His health had never been better, his sense of smell gradually

returned, and the tears resumed their natural channel; and he, as well as his friends, congratulated themselves, both on the moral and physical effects of the operation.

At the end of three years, no sensible alteration had taken place in the restored part. The shape of the nose was perfectly preserved; and there was none of that flattening which has usually been brought forward, by the opponents of this operation, as one of the greatest objections to be preferred against it. In those cases where this finally occurs, it almost universally arises from the flap, in the first place, being too small; and, the internal surfaces not being well opposed, adhesion fails, and, as soon as the swelling subsides, the nose is left flat and deformed.

In the present instance, the operation was almost a new life to the subject of it, restoring him to the society of his friends, and enabling him to establish himself in business.

Remarks. — One of the greatest difficulties of the operation was the management of the sutures to close the wound in the forehead, and to confine the new nose in its situation.

At that part of the flap which was to simulate the alæ, — as it was necessary that the integument should be directed inwards, — pins, of course, could not be used; and here a plan recommended by M. Labat was adopted, which was followed by partial success. A thread being passed, first through the integument of the face, and then through the flap, at about two lines distant from their edges, the ligature was so tied as to produce a fold; and, the better to effect this, a small cylinder of adhesive plaster, was confined under the threads, so as to make a strong compression on the wound, and to force the edges into their places. This succeeded completely on one side; on the other, union was not so entire.

During the whole of the treatment, it was necessary to keep the nostrils distended by small tubes. The substance which answered best for this purpose was the barrel of a quill, the end which remained in the nose being stopped up with melted sealing-wax, and a small aperture cut in the side, through which the air could pass freely. The tendency to contraction was very great, so that, at one period, the tubes being left out during the night, it required considerable force to replace them.

As the new nose was formed entirely of skin, it will perhaps be supposed, that the integuments composing it were flaccid, and the form of it easily destroyed. This, however, from reasons easily appreciable, was not the case. The integuments of the scalp being naturally of great thickness, by the suppuration which took place from the inner side, assumed a firmness almost similar to fibro-cartilage; and, at the root of the nose, the internal surfaces coming in contact, contracted adhesions, so as to make it perfectly solid at that part. The columna also formed a round and solid pillar to support the tip of the nose.

Great precautions had been taken to guard against exposure to cold, which, by stopping the circulation, might at once defeat the whole object of the operation. As soon, however, as adhesion had taken place, it was perceived that no danger from this source was to be apprehended; and, although during the winter he slept in a room in which water frequently froze, and was repeatedly exposed during some of the coldest days, the temperature of the organ was never greatly diminished.

The cicatrization of the wound in the forehead was retarded by the cold weather, and less than half the time would have been required, had the operation been performed during a warmer season. When it had diminished to a small size, and cicatrization — as frequently is the case in the filling-up of large wounds — seemed to have been arrested, great benefit was found from the use of an ointment composed of six drops of creosote to an ounce of simple ointment. On the application of this to the wound, the effects were at once apparent. A small pellicle formed over its whole surface, which was shortly replaced by a firm, consistent cicatrix.

In one or two cases operated upon by Dieffenbach, much swelling took place in the new-formed nose the day after the operation, arising from the difficulty with which the blood was conducted off by the veins. In one case, the nose became so enormously distended that it was feared the adhesions would be entirely destroyed; and it was only by the repeated application of leeches, seventy or eighty being employed in the course of forty-eight hours, that this was avoided. In the present case,

from the extension given to the incision on the left side, care being taken that traction should not be made too forcibly on the part, so as to compress the pedicle at its base, the circulation was, from the first, unobstructed.

This case, having been the first successful one in this country, has been more fully related. It must be remembered that it was done before the days of ether, which greatly facilitated subsequent tedious operations of this description.

CASE XIV. — *Rhinoplastic Operation, by the Method of Taliacotius.* — This was a case of lupus of fifteen years' standing. The commencement was by a spot on the very tip of the nose, which gradually extended, becoming finally of a livid red color, and having its surface covered by numerous elevations of a tubercular appearance. In his ordinary state of health, and when perfectly quiet, the only sensation in the affected part was that of heat and itching: but, on the slightest derangement of the system, and upon any extraordinary exertion, an intense burning and stinging was felt, not only in the nose itself, but in the surrounding integuments; and often so insupportable as to oblige him to desist from his work, and have recourse to cold applications, for temporary relief. He submitted to a great variety of treatment, continued for a number of years, but without the slightest benefit. A caustic had been applied, a year before, which destroyed a part of the skin, and the subjacent cartilage; most of the disease remaining undisturbed.

He came to Boston, determined to have the affected part removed, and the loss of substance supplied by the Taliacotian operation. At this time, the nose had a very pinched appearance, the skin being of an intense red towards the tip, and having in its substance a number of hard, tubercular bodies. A slight redness extended over the ala nasi of the right side. In the centre was a depression, and loss of substance, where the caustic had been used.

The operation was performed on the 8th of April, 1840. The disease, which extended up as far as the nasal bones, was very carefully removed; and the cartilages below, not destroyed by the caustic, were found to be in a perfectly healthy state. The

dimensions of the flap were carefully taken, and marked out on the fore-arm. The traces were made on the radial side of the left arm, about two inches from the styloid process of the radius. This flap was dissected up, including with the skin, the sub-cutaneous cellular membrane, and was secured in its new situation, in contact with the face, by five sutures; the arm being firmly fixed in this position by appropriate bandages. Nourishment was to be taken through an elastic tube; the mouth being so covered up as to prevent the direct introduction of food. He was placed in bed, and supported in a sitting posture by a common bed-chair.

On the following day, the 9th, there was some appearance of erysipelatous inflammation on the bridge of the nose: he had been pretty quiet, and had slept a little, but required constant watching to prevent him from slipping down and doubling himself up in the bed. He complained much of a want of solid support to the elbow; and therefore a wooden apparatus was constructed, and placed across the bed, which served as a firm resting-place for the arm, and enabled him to maintain more easily the proper position. The pulse was sixty; and, throughout the whole period of his confinement, it remained below the ordinary standard. On the 10th, he complained less of his arm, but was exceedingly restless. During the day, he was removed to an easy-chair, and the change afforded great relief.

The state of things varied little from that already described, until the fifth day, the period appointed for separating the connection between the arm and face. On this day, the base of the flap was divided: a perfect adhesion had taken place.

The wound in the arm was dressed, and a small portion of the skin which projected bound down in its place by adhesive straps. The irregular portions of skin attached to the nose were removed; and a slight compression made on the edges around the nostrils, with strips of adhesive plaster.

The arm, on being relieved from its confinement, was not so painful as might have been expected: there was an almost entire loss of power in the flexor muscles. In the course of a few days, however, it regained its healthy state of feeling and motion.

By the 20th of April, the newly transplanted skin had contracted to nearly the natural size ; the line of union with the skin of the nose was perfectly lineal ; all the abrupt and useless portions of skin on the lower edge of the nose had sloughed off, leaving a perfectly even and rounded edge to the nostrils.

On the 23d, I was surprised, on removing the green cot which covered the dressings, to find that the whole cuticle of the restored part had peeled off, leaving the surface quite raw, and covered by the green coloring-matter of the silk. This at first seemed likely to prolong the period of recovery, but it proved of material benefit : a slight suppuration commenced, which brought down the skin to a natural thickness, and rounded off, in the most perfect manner, every inequality ; and seemed also to melt the skin into the adjacent integuments, so as almost to destroy the traces of the line of union. A new cuticle rapidly formed ; and, by the end of the month, he was quite well.

Subsequently, having exposed himself to the sun, he was troubled with itching in the right ala of the nose, where a slight redness remained. He came to me, very desirous to have the skin of this part at once removed. He was anxious that the experiment should be tried of cutting a piece of skin from the arm, and immediately placing it in the wound, to supply the loss of substance. Although I did not consider this part of the operation necessary, I yielded to his desire, and made the attempt. The diseased skin was removed, and its place supplied by a piece from the fore-arm, kept in place by lint moistened in blood. On removing the dressing, at the end of four days, a good union had taken place.

It will be perceived, that, in this case, the old operation, as performed by Taliacotius, of taking the desired integument from another part of the body, was preferred to the Indian method, in which the skin is borrowed from the forehead and hairy scalp. The reasons are perfectly obvious. The loss of substance to be supplied was small. By the course resorted to, a scar on the forehead was avoided ; and that on the arm was of no importance.

The operation was not precisely that of the Italian surgeon. Taliacotius preferred taking the skin from the arm near the

insertion of the deltoid muscle; and, by adopting this method, the limb can be much more securely fixed in contact with the head. In the present case, the patient being a muscular man, the arm could only be brought to that position with great difficulty.

It also differed from that of Taliacotius, in the early separation of the transplanted skin from its connection with the arm, on the fifth instead of the fourteenth or fifteenth day; and, as the principal objection to his method is the position in which the arm is so long and painfully confined, this is certainly a very important consideration. The Italian surgeon raised the flap gradually, allowing it to suppurate and contract. The most important point, however, the adhesive process, must by this means have been rendered much less certain.

The accompanying print will afford some idea of the position of the patient while the arm was confined to the face.



CASE XV. — *Rhinoplastic Operation.* — A young woman, 27 years old, from Maine, applied to me in 1839, having lost

her nose in the following manner: Sixteen months before, having a wart on her nose, she was induced by her friends to apply for advice to one of those quacks styled *cancer doctors*, who easily persuaded her that the affection was of a cancerous nature. A caustic was used, which produced so great a degree of inflammation as to alarm her, and oblige her again to have recourse to him. His answer was that the application should be continued, not only to the wart itself, but over the adjacent parts, "so that none of the *roots* of the disease might escape." It was therefore persevered in; and so effectually, that, at the end of a fortnight, all the flesh of the nose sloughed off, leaving her in a most deplorable condition. On re-application to the quack as to what was to be done under these circumstances, he assured her that it was a most happy termination of the disease, which, by these means, had been wholly eradicated; and that the nose, in the course of time, would *grow out again*, and be perfectly restored.

These assurances, as may well be conceived, were not destined to be realized: the edges of the wound gradually cicatrized, leaving her in the state in which I saw her sixteen months after.

Her condition was much as follows: The tip of the nose, together with the *alæ nasi* and corresponding portion of the septum, was entirely destroyed, leaving the nasal passages exposed: the *ossa nasi*, with a small portion of skin covering them, remained entire, their edges being lined with a firm and somewhat vascular cicatrix. In other respects, she was a good-looking woman; and her health as little disturbed as could have been expected.

The operation was done on the 17th November of the same year. The patient was placed in a recumbent position, with her head well supported by pillows. The dimensions of the flap were traced on the forehead, nearly one-third larger than was necessary for the formation of the new nose. This was dissected up, and every precaution taken to leave the pedicle of skin between the eyebrows sufficiently large to allow free vascular communication. Care was also taken to leave the angular arteries unwounded, as upon these depended the principal means

of support to the flap. Before proceeding farther, the edges of the wound in the forehead were approximated by the twisted suture. This was facilitated by the incision in the scalp being prolonged to a pyramidal form.

The cicatrix covering the nasal bones was now removed, the flap twisted round, and secured in its place. The strip which was to form the columna of the nose was deeply implanted in the upper lip; the whole was supported by small strips of adhesive plaster, and covered with lint, to preserve, as much as possible, its temperature; small tubes were introduced into each nostril.

The patient was directed to keep in bed, to remain perfectly still, and to breathe through the mouth.

On the following day, the nose was swollen; pulse seventy-two; she was rather restless. On the 21st, the sutures were removed; entire union had taken place. The sensation was nearly natural, and, as in the previous case, but slightly referred to the part from which the skin had been transplanted. The form of the nose was good, with a regular curved outline; the *alæ nasi*, also, were well defined. The nostrils were kept open by means of the small tubes, which were removed daily, and cleansed. The wound in the forehead was dressed daily with creosote ointment. She also derived much comfort from a creosote gargle, for purifying the mouth. On the columna, which was taken from the scalp, hair continued to grow; but was easily removed by scissors, so as to be scarcely perceptible.

From this time, she gradually gained in strength, and was able, in a few days, to sit up. The wound in the forehead slowly cicatrized, and the nose assumed a more natural appearance. In the following spring, I performed the comparatively trifling operation which was required for confining the pedicle in its place. The cicatrix of the forehead was then quite firm, and easily concealed by the hair.

The operation, in this case, with some slight exceptions, resembled the first. In the first operation, the twisted suture was used for confining the new nose in its place. In the present instance, however, the interrupted suture was substituted, and answered a much better purpose; the points of ulceration, on the removal of the threads, being less.

CASE XVI. — *Rhinoplastic Operation, by the Method of Taliacotius.* — In this case, the operation was performed according to the method recommended by Taliacotius, modified, however, by the experience which modern practice has suggested; the skin being borrowed from over the biceps muscle, as in the Taliacotian operation. It is more interesting, from its being, so far as we know, the only one which had been successfully performed by this method for twenty years previous, the separation of the flap being made at an earlier period than in any case on record.

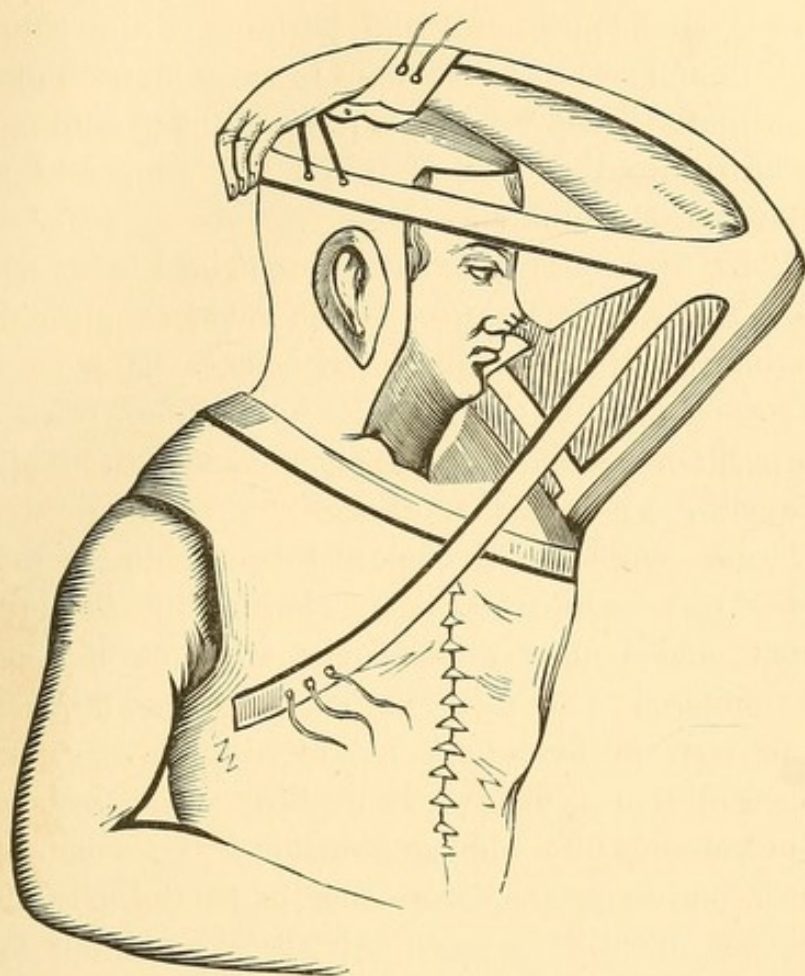
The union was thought sufficiently perfect at the end of seventy-two hours, or three days, to warrant the separation of the new flap. In earlier cases, reported by Graefe, Delpeck, and others, ten to fourteen days were thought necessary to secure union. The advantage of this early division of the parts will be easily perceived. The preference of this method is, that no scar is left on the forehead. At the same time, it must be acknowledged, that the skin of the arm does not possess sufficient firmness or elasticity for the construction of the nose, where the substructure, such as the bones and cartilages, have been destroyed.

The patient was a female 30 years old. Having a warty excrescence on the nose, she applied, as in the previous case, to a quack, who enjoyed notoriety in the treatment of cancers, and who, as usual, at once informed her that the disease was cancerous, and advised its removal. A caustic was applied, but so badly managed, that not only the disease, but a portion of the nose also, was destroyed, leaving the unfortunate subject in a most distressing situation.

It looked exactly as if the nose had been neatly excised: the skin, a portion of the cartilage forming the septum nasi, and about one-third of the columna, were wanting. The nasal cavities were exposed, and the deformity produced of a very striking and disagreeable character.

The loss to be supplied was not sufficient to justify a resort to the Indian method, especially as the lady was not so stout as to render that of Taliacotius insupportable.

I advised her to return home, and to have a bandage made



such as is described and depicted in the work of Taliacotius, and to exercise herself daily for a few weeks in keeping the arm in contact with the face, in the position which it would be requisite to maintain after the operation. The operation was performed on the 21st of October, 1840, in the presence of Dr. Ed. Reynolds, Dr. S. D. Townsend, Dr. H. B. Inches, and a number of other medical gentlemen.

The cicatrix covering the edge of the nostrils was first removed, and the apex of the septum and columna nasi made into a raw surface. A flap, nearly double the size required, was now dissected out from over the upper part of the biceps muscle of the right arm, its base, which presented downwards, being left attached. The bleeding having ceased, and the flap having contracted nearly one-half, the arm was brought up to the face, and the edges of the flap confined in contact with the raw surface of the nose by six sutures. The bandage of Taliacotius,

of which the accompanying wood-cut gives a good idea, as well as of the general appearance and position of the patient, was now applied, and served to maintain the arm immovably fixed in contact with the head.* The whole of this painful operation, which was before the days of ether, was supported with the most determined fortitude.

Oct. 22d. Since yesterday she has remained in an arm-chair, preferring the sitting posture as the most comfortable, both for breathing and for taking nourishment. For an hour or two after the operation, the arm was quite numb, from its constrained position and the pressure of the bandages. This gradually changed to a painful sensation.

23d. She complains to-day of severe pain in the wrist, which was very soon relieved by wetting the bandages with laudanum; and almost immediately after each application, she was composed to sleep. The bandages were relaxed a little from being wet, but not so much as to do injury.

24th. To-day, seventy-two hours after the operation, I proceeded, in presence of a number of medical gentlemen, to divide the pedicle, and release the arm from its painful position. On first letting it down, it appeared quite paralyzed; but by gentle friction the power of motion and sensation was gradually restored.

A perfect adhesion had taken place between the new flap and the right side of the nose. On the other side, the skin was so wrinkled up from the pressure of the head, that it was not possible to determine what was the state of union. Out of the new flap a pedicle was now shaped, to serve for the completion of the columna, and was confined in contact with what remained of the old one by a single suture.

The patient was in good spirits, and appeared but little fatigued from the painful position in which she had been confined for such a length of time. Her sufferings had certainly been

* I am indebted to the kindness of my friend Dr. Inches for a copy of the original folio edition of Taliacotius, bearing the date of 1597, from which this wood-cut is copied. This very rare and curious work was obtained, with much difficulty, in Italy; and but few copies are to be found in preservation at the present day.

greatly alleviated by the possibility of being able to move about the room without interfering with the adhesive process, owing to the perfect retentive power of the bandages.

25th. Quite comfortable; the tip of the nose looked well; the edges on one side somewhat livid, but, on being touched with the knife, bled freely; a portion of the new columna in a sloughing state.

Nov. 11th. A small piece of the skin which formed the septum having sloughed, the remainder has settled down, and at present is firmly united in its situation. The nose has a good shape, but is still a little swollen.

Dec. 12th. She returned home well. Her nose had entirely healed; its form was good; the tip was slightly turned up, and the whole organ a little shortened when compared with its original dimensions, but was still agreeable, and presented nothing remarkable to a casual observer; the line of union had so melted down into the surrounding parts as to be scarcely perceptible.

CASE XVII. — Mrs. F., 30 years of age, was treated by me, for a number of years, at my house and at the Hospital, for an ulceration of the nose looking like lupus, but probably specific, which she says first attacked her breast. The disease of the breast commenced eight years before. The whole nose was attacked and destroyed; the vomer, the left turbinated bone, and the orbital process of the superior maxillary. The whole posterior nares was exposed, and the opening of the Eustachian tubes distinctly visible. The palate was thrown up in the act of swallowing. The left maxillary sinus was quite open on the inner side. The destruction of parts was much greater than I have ever before seen, and the opening on the face larger. A cure was finally effected by the persevering use of the iodide of potassium. When the operation was performed, — March 28, 1855, — the ulcer had been healed up for eight months. The flap was taken from the forehead, as in two of the previous cases, being somewhat modified in order to cover the irregular aperture. The part to form the septum was taken from the scalp, previously shaved, and was an inch and a half

long. It was twisted around, and nicely adjusted in its place with sutures; the edges of the skin on the face having been made raw. She was much depressed by the operation; but the skin united well, and she ultimately recovered, after the usual protracted treatment which these cases require, with a most excellent nose, and a very slight scar on the forehead. A small aperture was allowed to remain at the left side of the nose, at her own request, to facilitate the removal of the long black hair, which continued to grow from the septum, in a direction down the throat, causing considerable irritation. The aperture referred to was covered with court-plaster.

This case, as most of the others, has a touch of romance about its subsequent history. She called on me some years after, and said that her good looks had been so far restored, that she had attracted the attention of a soldier, and had been a second time married. The marriage, however, turned out an unfortunate one; as I have lately learned from my brother, Mr. J. S. Warren (who was called on to administer charity to her), that her husband, in a fit of intoxication, had threatened her life in the middle of the night, and so alarmed her as to make her jump from a window in the third story, which nearly terminated her career.

CASE XVIII. — A gentleman, 49 years of age, a tall, handsome, and powerful man, wrote to me in the early part of the year 1857, to know if any thing could be done to restore his nose, the greater part of which he had cut off in a temporary fit of insanity some years before. I described to him the nature of the operation, as being a very painful and fatiguing one, and requiring a good part of the skin of the forehead to be used in the manufacture. I represented the very worst side of the picture to him, fearing a person of his situation and appearance would hardly be satisfied with the rough substitute made for one of the most important features of the face, however successful the surgeon might be. He answered me, that he was determined, at any risk, to have the operation done; and, in the month of October, he came to my house, having made a journey of from one to two thousand miles.

After an examination of the case, and finding how much of the skin of the forehead it would take to supply the lost organ, I felt great hesitation at the undertaking. He stated, however, that he had come a great distance for this purpose, that he placed himself fully under my direction, and would wait any length of time till I had fully matured my plans.

Having finally determined to do the operation, it was performed on Oct. 25th, with the assistance of Drs. Briggs, Hayward, and Slade. The remains of the old nose were first slit open in the centre; and the lateral flaps, which had partially caved in, were dissected up from their adhesions. A large triangular flap of skin, involving nearly the whole forehead, was now dissected up, with a small column, taken from the hairy scalp, to serve for the septum of the nose. This flap was enveloped in a cloth until the wound in the forehead had been dressed. The operation otherwise was conducted as described in the previous cases.

From the turgid state of the vessels of the face, the operation was necessarily a very bloody one. For this reason, and from the necessary delays in determining the size of the flaps, and fitting them nicely in their places, it lasted nearly three hours. The patient declined to take ether, and bore the whole of this long and painful operation with the most unflinching firmness, so that a bystander could hardly have determined whether the surgeon was operating on a living or dead subject.

He passed a quiet night. The next day his pulse was eighty, and he had very little uneasiness in the nose or forehead. On the 28th, the forehead was dressed, and all the angles and proximate parts connected by sutures found to have united by the first intention.

On the 29th, the new nose was dressed, and the flaps were so well united to the cheek, that they seemed to have melted into it.

On Nov. 1st, the plugs were removed from the nostrils; the patient was up, and about the room.

Nov. 22d. He had been out of doors for two weeks in perfect health. The wound in the forehead was healed, leaving in the centre a scar scarcely perceptible. The nose looked well,

the sensibility was natural, perhaps a little dull, not referred to the forehead. The twist in the pedicle had become effaced by a most remarkable transposition of the parts; the scar, which originally commenced on the right side, being drawn over to the left by contraction of the tissues. The small apertures which remained on this and the opposite side of the pedicle were easily obliterated by subsequent manœuvres.

The patient was extremely elated by the success of the operation, and by the very natural appearance of the substitute. The re-action, after this long period of retirement, brought on considerable excitement of feeling. Notwithstanding my repeated precautions, and advice to him to return home, he indulged in a very free course of living; which ultimately terminated in an attack of apoplexy, which destroyed him.

OPERATIONS FOR THE RESTORATION OF THE LOWER EYELID.

The difficulty of repairing the eversion of the eyelid after burns and other accidents attended by destruction of the integuments is well known.

Since the introduction of the autoplasmic methods for the restoration of lost parts, the transplantation of cutaneous flaps for supporting the remains of the everted eyelid has been attended with success. The two following cases are given in illustration:—

CASE XIX.—The subject of this was a boy 12 years of age, from Weymouth, Mass. When an infant, he was dropped into the fire. The consequence was an extensive burn of the left side of the face, and a partial destruction of the lower eyelid. As the wound in the cheek cicatrized, the remains of the lid were completely everted, and the tarsal cartilage with its cilia firmly bound down to the lower edge of the orbit.

The effect of this was a constant epiphora, causing much irritation of the integuments. From the exposed state of the conjunctiva, it had become thickened, having the appearance of epidermis; and the cornea, from exposure to air, presented an

opacity which was daily increasing, and threatened destruction of vision. Under these circumstances, the following operation was performed on the 12th of June, 1841:—

An incision, about an inch and a half in length, was made parallel with the commissure of the eyelids, and about two lines below the palpebral margin; and, after a careful dissection, the remains of the eyelid were separated from the edge of the orbit. The dissection was then continued upwards between the tarsal cartilage and the conjunctiva, and the connections so far destroyed as to allow the lid to be restored to its natural position. The thickened and diseased subcutaneous cellular membrane was then completely removed.

By the separation of the edges of the skin, a large oval-shaped wound now presented, and this was to be filled by a portion of skin taken from a neighboring part. To effect this, an incision was commenced from the outer angle of the wound, and carried in a semicircular direction over the temple, at which point, under the hair, was the only portion of sound skin which had not suffered from the effects of the burn: an oval flap was here dissected out, about one-third larger in size than was required, and, having fully retracted, was twisted round and maintained in its situation by means of sutures, and a slight pressure exercised upon it with a roller bandage. Before terminating the operation, the thickened conjunctiva, which formed a projection beneath the lid, so as to prevent its perfect application to the eyeball, was raised up, and entirely removed.

The termination of this case was quite successful. At the end of four days, the dressings were removed, and the adhesion of the flap was almost complete; a slight suppuration only, at its inner angle, having occurred. The parts were all much swollen. At the end of a week, the pedicle which connected the newly transplanted flap to the neighboring parts was divided, and bled freely. The patient was sufficiently well in a month to return home.

About three months after, he gave the following account of himself: He was able to close the eye perfectly, and the tears had resumed their proper channels. The newly formed lid seemed to fulfil all its functions, and there was no disposition

to eversion. The opacity of the cornea had so far disappeared as to be scarcely perceptible. The only circumstance which required a remedy was a disposition in the new lid to stand out from the eyeball, as if from a swollen state of the conjunctiva: this was remedied by the repeated application of a pencil dipped in sulphuric acid, so as to destroy a narrow strip of the conjunctiva. The transplanted skin at first protruded, but gradually settled down to the level of the surrounding integuments.

CASE XX. — The second case was a young lady 19 years old. The accident which produced the deformity was very similar to the preceding one; having fallen into the fire when an infant, she had been badly burned in the face. From this resulted a very extensive cicatrix, affecting nearly the whole skin of the face, and in some parts implicating the subcutaneous textures. The left eyelid was drawn down and everted at its external angle, leaving the eyeball exposed. From the destruction of the integuments of the cheek, the left angle of the mouth was drawn upward in a direction to meet the external angle of the eye, there being about an inch and a half distance between the two. A large, firm band of indurated and thickened integument extended from the forehead perpendicularly across the bridge of the nose. The external edge of the right eye was also slightly drawn downward by a cicatrix; but, the cheek of this side having partially escaped the effects of the burn, there was no eversion of the eyelid. The following operation was planned and executed on the 7th of November, 1840.

An incision, two inches in length, commencing on the cheek, midway between the eye and upper lip, was carried with a semicircular sweep in a direction upward and outward towards the ear, its convexity being downward. The skin was then dissected up, both above and below, so as to relieve the traction of the integuments in either direction; and, on this being accomplished, no difficulty was found in restoring the eyelid and angle of the mouth to their natural positions.

From the separation of its lips, the wound on the cheek now gaped widely open, being an inch in the perpendicular, and two

inches in the transverse, diameter; and this was to be filled up by borrowed integument. The effects of the burn having penetrated into the muscular substance, it was necessary first to remove all the indurated substance covering the floor of the wound. A large oval-shaped flap, one-third larger than was necessary to fill the wound, was dissected from the temple, twisted round, and without difficulty adjusted, and secured in its new situation by means of sutures, as in the preceding case. The wound on the temple was drawn together by sutures, and in a direction to favor the transplanted skin in remedying the deformity.

The unseemly cicatrix on the bridge of the nose was now completely dissected out. The vessels which were divided during the operation were allowed to bleed until they ceased voluntarily, it being desirable to avoid ligatures. The wound was dressed with graduated compresses, secured by a bandage. Quiet was enjoined; notwithstanding which, from talking, a slight hemorrhage was produced, which partially prevented the union of the transplanted flap.

But little constitutional irritation followed the operation. On the fourth day the bandage was removed, and two-thirds of the flap was found to have united: the inner portion, towards the nose, was raised up by a coagulum of blood, and the union at this point, of course, defeated. The wound on the temple had, in a great measure, united by the first intention. On the sixth day, the ligatures were all removed, and the inner portion of the flap, which showed a disposition to slough, was cut away; the wound at this point, where, fortunately, the support was least required, being allowed to heal by the second intention.

At the end of six weeks, the wounds had all healed; and she returned home, greatly improved. There was no disposition to eversion of the eyelid, and its functions were well performed. The mouth was also restored to nearly its natural appearance. The facial expression was greatly improved by the removal of the unsightly band, which projected out over the bridge of the nose.

The above cases are selected from among a great number of similar instances; the operations of a plastic character about

the face being, as a general thing, unusually successful. Whatever operation is used for restoring the eyelid or the mouth to its position when drawn down by a cicatrix, it is important that the integument should be freely dissected up from the subjacent parts, so as to allow the eyelid or mouth to be restored to its position by bringing the integument on a different plain, as regards the subjacent parts, from that which it occupied before. A simple division of the scar, and allowing the edges to separate, even if a flap is introduced, would not remedy the difficulty. In the eyelid particularly, the dissections must be very thorough, and carried quite up to the edge of the lid.

During the past year I have operated on two children, a boy and a girl, both about 8 years of age, in which the integument of the lower lip and entire neck had been destroyed by fire; the mouth being open, and the edge of the lower lip in contact with the sternum. In one case, the jaw had been completely deformed by the tension, the two middle incisors being some distance in front of the lateral ones: the whole face, in fact, with the lower lids, was on a stretch; and the eyeball was strained upwards, in order to allow the patient to see objects in front of him. In these cases, by a semicircular cut at the base of the scar on the sternum, and subsequent dissection, the head was liberated, and restored to its place: the wound being covered by skin, slipped along from the sides of the neck, in one case; in the other, two tunnels of skin running beneath the scar supplying the requisite integument. In the case of the boy, which was the most extreme, it was difficult for him for some time to get accustomed to the new position of the head, which felt to him as if about to tumble off backwards, the support in front being lost.

The cure of but few of these cases can be completed by a single operation; a series of operations, extending sometimes through a number of years, being required, if the destruction of the integument is great, and the deformity implicates a number of organs. The organs interested in the health and nutrition of the patient must be first attended to; the finishing touches, affecting the appearance, being left till a later period.

EPITHELIAL CANCER AND RODENT ULCER.

There are three kinds of morbid affections, each accompanied with ulceration, and situated upon some portion of the face, which it is necessary to distinguish from each other, — epithelial cancer, lupus, and rodent ulcer.

Epithelial cancer is generally found upon the skin, and especially upon the lower lip, though it is not confined to this situation, but occurs upon other portions of the body, as the tongue, the scrotum, the labia, around the anus, and even in the larynx or pharynx, upon the uterus, and in the bladder. I have never seen a case of it in the upper lip.

At the commencement of the disease, there is noticed a swelling, with a round or oval hard base; or a wart, with a projecting, dark, dry summit; or simply a scale of a dark color, most generally seen on the cheek, which, after repeated removals, perhaps through a series of years, ultimately terminates in ulceration: this extends, involving the adjacent tissues, till a large ulcer is formed, with the edges everted and excavated; the base is reddish, concave, and bleeds easily; it discharges a thin, sanious liquid.

The different appearances dependent upon the variety of situation, or the manner in which the peculiar epithelial cells are situated, is fully and minutely described by Paget, who also gives a description of the microscopic appearances.

There is no tendency towards healing; and, if left to itself, the destruction of substance becomes more extensive, the lymphatic glands connected with the diseased part enlarge, finally ulcerate, and death is the result. Early excision will usually arrest, and sometimes destroy, the disease, though it may return in the neighboring tissues.

In regard to cancer of the lip, the disease is so frequent that it is hardly worth while to adduce cases. So far as my experience goes, it is more generally situated on the left than on the right side; having its origin in some irritating cause frequently repeated, such as the stem of a clay tobacco-pipe, or the passage over the lip of the saliva saturated with tobacco, in tobacco-chewers.

I have been much struck, in removing cancer of the lip, to find how far, in almost every instance, the real cancerous deposit extends beyond the apparent disease on the free surface. Too great caution cannot be urged in regard to giving the ulcer a wide berth; and it will be found, on dissection, that the sound parts have been seldom sacrificed.

After removal, it perhaps may be advisable to enjoin on the patient a simple and unirritating diet, avoiding animal food, and all alcoholic stimulants, for a limited period of time.

Dr. Walshe says, "There is only one affection which may easily be confounded with cancer of the lip; viz., venereal ulceration, with an indurated base. I believe it will be admitted by all persons who have had occasion to observe much of diseases of this nature, that it is often impossible to determine, from the local characters of the ulceration, whether this be syphilitic or cancerous."

In the cases, however, which I have seen, the chancre was on the upper lip instead of the lower, a circumstance which I have never met with in regard to cancer.

Lupus generally appears first upon the nose, or the cheek, near the nose, as a small tubercle, yellowish on the summit, and reddish around the base. The ulcer which forms is rather more superficial than in the preceding variety; with less swelling; the edges are ragged, not indurated, and sometimes everted and excavated. *Lupus*, after ulceration has commenced, is not confined to the integuments, but may also involve cartilage and ligaments, destroying large portions of the face. Sometimes it heals spontaneously, though it is then more likely to return in the cicatrix; but, if extirpated by the knife or caustics, it seldom returns. Cicatrization commences at the circumference. The cicatrix is peculiar, usually being crossed by elevated bands, and having knobs scattered over its surface, at first quite livid, subsequently becoming white.

The last of the three diseases received from Lebert its name, — *rodent ulcer*, — which has since been adopted by the best authorities. It is most frequently situated upon the eyelids, sometimes upon the cheek, or more rarely on other portions of the face. I have never known it to occupy the lower lip. As

the disease is an interesting one, and, in its diagnosis, comparatively a new one, I will venture to quote the following excellent description of it from Paget: "It is of irregular shape, but generally tends towards oval or circular. The base, however deeply and unequally excavated, is usually, in most part, not warty or nodular, or even plainly granulated: in contrast with cancerous ulcer, one may especially observe this absence, or less amount, of up-growth. It is also comparatively dry and glossy, yielding, for its extent, very little ichor or other discharge, and has commonly a dull reddish-yellow tint. Its border is slightly, if at all, elevated; if elevated, it is not commonly, or much, either everted or undermined, but is smoothly rounded or lowly tuberculated. The immediately adjacent skin usually appears quite healthy. The base and border alike feel tough and hard, as if bounded by a layer of indurated tissue about a line in thickness. This layer does not much increase in thickness as the ulcer extends; and herein is another chief contrast with cancerous ulceration: in the progress of rodent ulcer, we see more destruction; in the cancerous, we see destruction with coincident, and usually more than commensurate, growth. It is only in the rarest cases that a growth is associated with rodent ulcer."

Mr. Hutchinson has also published an excellent article upon this disease, in the "Medical Times and Gazette" for Sept. 29, 1860.

Rodent ulcer requires complete extirpation by the knife or caustics. It is very likely to return; but, in the following cases, did not return, like cancer, in the exact spot: the disease seemed to follow on at one side of it: there was no glandular complication. (The few cases which follow will serve to illustrate some points in regard to these diseases.)

CANCER OF THE LIP. — The four following cases of cancer of the lip are principally interesting from being all that have occurred among females at the Massachusetts General Hospital for a period of over forty years, and from the fact that three of the four were ascertained to have smoked a pipe. They are quoted from the Hospital records: —

CASE XXI. — *Cancer of Lower Lip in Female.* — "P. G., aged 62, married; born in Maine. Entered the Hospital, May 4, 1852.

"A healthy-looking old lady; knows of no hereditary tendency to malignant disease. Two years ago last summer, she suffered from 'canker' in the mouth and inside of lips, upon recovering from which, a small ulcer was noticed on the under lip, which was soon followed by a small hard 'wart,' not painful, but troublesome from constant itching. Last summer, this 'wart' became detached, and was followed by an ulcer, which has progressed to present appearance.

"At about the centre of lip projects a red, fungous mass, at the base about one inch by three-fourths in diameter; while the everted and protruding fungus measures in either diameter, over its convexity, one and one-half inches. The mass is soft, red, and the base is not indurated. One or two enlarged lymphatics are felt beneath the jaw, tender, but not painful. Tumor, though not tender nor painful, gives a sensation of weight, and makes speech fatiguing. She has smoked a pipe for years. Operated upon, and discharged 'well.'"

CASE XXII. — "E. C., aged 80, widow; born in Ireland. Entered the Hospital, Oct. 8, 1853, with epithelial cancer, which was removed from the left side of lower lip.

"Being an out-patient, the history of her disease is not known, except that she has been in the habit of smoking a pipe for many years. She was discharged well."

CASE XXIII. — "B. S., aged 50; born in Ireland; married. Entered the Hospital, June 6, 1860.

"This woman has an ulceration on lower lip, which was first noticed about twelve months since. There is some induration around the base. No enlargement of glands about the neck. Otherwise healthy.

"She has been in the habit of smoking a pipe.

"She was operated upon, and was in a few days discharged well."

CASE XXIV. — "K. L., widow, aged 70, born in Ireland; entered the Hospital, March 9, 1866.

"Nine months ago, a small 'scale' appeared on lower lip, at the margin of the mucous membrane, upon removing which a slight 'crack' was noticed. The scale was in a short time renewed, and began to assume the appearance of a scab, which has increased in size till now.

"At present it resembles a wart the size of half of a large cherry, circular, firm, edges sharply defined; surface rough, and of a brown color; surrounding tissue not indurated. It is about one-third of an inch in diameter, and is raised one-twelfth of an inch from surface; bleeds easily; not tender nor painful. No hereditary tendency of any nature.

"She has never smoked a pipe nor chewed tobacco. Otherwise healthy.

"Tumor was removed March 10th; and, on the 17th, the wound having perfectly united, and all the sutures being removed, she was discharged well."

Recorded Cases operated on at the Massachusetts General Hospital.

Whole number of cases of cancer of lower lip up to Jan. 11, 1861	77
Males	73
Females	4
Addicted to smoking a pipe	44
Not in the habit of smoking	7
Not ascertained	26

CASE XXV. — *Chancre of the Upper Lip, resembling Cancer.* — In June, 1864, a servant-girl was admitted into the Hospital, with a tumor of the upper and left side of the lip, which was supposed to be cancer, and which she entered to have removed. She stated, that, during the previous winter, she had noticed a fissure on the left side of her upper lip, but did not pay much attention to it; nor did she think it any thing serious, until in May it enlarged, and the swelling implicated the adjoining parts: suppuration also commenced. Upon entrance there was an oblong ulcer, with an everted, fungous surface, about two inches by one, having a soft base, discharging moderately,

and causing pain; presenting, indeed, all the appearances characteristic of cancer. On being questioned upon the subject, she thought she might have contracted it while doing chamber work at the hotel. Behind her right ear, there was a herpetic affection of the skin.

The irritation of the parts was first relieved by a poultice, and she was put on a grain of the protiodide of mercury three times a day. A week after her entrance, she was etherized, and the disease thoroughly cauterized with the acid nitrate of mercury. It almost at once put on an improved appearance, and presented a healthy, granulating surface. On the 4th of July, she began to complain of sore throat, irritation about the glands of the neck, and her hair began to fall out. The sore gradually healed, and the chasm made by the great destruction of parts was almost entirely obliterated. She continued for some time afterwards under medical treatment as an out-patient.

CASE XXVI. — *Extensive Recurrent Epithelial Cancer of the Nose, and part of the Face. Operation. Cure.* — A respectable Irishwoman, 50 years of age, entered the Hospital, in May, 1859, for a formidable epithelial cancer, which occupied nearly the whole nose, and extended on the left side of the cheek to about the middle of the left orbit. The nostrils were completely obstructed by the tumor, which presented the most singular appearance, as of a round cauliflower mass placed upon the nose, with the two eyes peering over it. She said that, about six or eight years previous, the disease had commenced by a long, narrow wart, growing from the left side of the nose. This had been removed, by some unprofessional man, with a ligature. Returning again five or six years afterwards, it was cut out by a surgeon. It, however, very shortly re-appeared, and soon assumed formidable dimensions. Her health was good, and the principal suffering was from the irritating discharge supplied by the extensive granulating surface.

The tumor covering the left nostril was held aside, and the ala nasi cut through close to the face. All of the remaining portion of the mass was now encircled by an incision, and the tumor dissected off rapidly, in the midst of the most profuse

hemorrhage. The vessels being secured, the large wound was narrowed by passing sutures about an inch apart, and tying the wound up in segments, so as to obliterate about half of it. To the remainder was applied scraped lint, which was allowed to dry on. She suffered very little pain after the operation, though somewhat feeble, and in a few days was able to leave her bed. The wound gradually cicatrized; and, so long as I kept her in view, she remained perfectly healthy, and there was no recurrence of the disease.

RODENT ULCER. — CASE XXVII. — *Rodent Ulcer of the Nose, Eyelids, and Globe.* — J. C., 59 years of age, applied to me in 1860, for an ulcer, which implicated nearly the whole side of the nose, the lower eyelid, and the eyeball of the right side. His father was living at the age of 86 years: his mother died of consumption. Thirteen years before, while cutting wood, a chip flew, and struck him on the cheek under the eye. A pedler, in the yard at the time, applied a mixture of gun-cotton. At night, his face swelled; and, subsequently, the wound ulcerated, and spread to some distance down the cheek. For several years it kept its place in the cheek; but gradually, in spite of treatment, it invaded the eyelid, and finally attacked the conjunctiva, and penetrated to the periosteal membrane behind the eyeball. Dr. James C. White, by applications, had kept it at bay; but finally referred him to me for operation. The appearance of the ulceration, which now occupied the side of the nose, and had destroyed the left eyelid, and conjunctiva, covering the eyeball, was unlike either the raised disease called epithelial cancer, or lupus, with its cut edges. It had more of the look of a dried ulcer, adhering firmly to the deep-seated parts, and with but little substance. It answered fully to the description of "Rodent Ulcer," described by Mr. Hutchinson in his differential diagnosis of the diseases mentioned above. I removed the whole disease with the eyeball, cut away the edge of the upper eyelid, with the lashes, dissected up the skin of the cheek, and brought the raw edges of the eyelid and cheek together. He had a good recovery; the socket being gradually entirely filled up with an adventitious tissue, and the skin being stretched

across its external aperture. The nose cicatrized well, and the scar afterwards remained healthy.

On Oct. 10, 1863, a small ulcer, the size of the head of a pin, appeared on the edge of the socket. This occasionally spread, and was obliterated by grinding into it nitrate of silver.

This ulceration did not extend much in breadth, but seemed to penetrate backwards very slowly: cerebral symptoms occurred, followed by general deterioration of the health; and he died, about a year afterwards, with very little external manifestation of disease.

CASE XXVIII. — *Rodent Ulcer*. — H. R. C. was operated on by me, Feb. 8, 1866, for the above disease. He was 60 years of age. About twelve years ago, he had a small pimple on the right cheek, near the nose. This remained quiescent for some years, when he applied caustic to it, under which it disappeared. It was followed by an indurated tumor under it. About four months since, finding this increasing, and involving the skin, he made repeated applications to it of the acid nitrate of mercury, which caused a deep ulceration. This increased after the applications were stopped; and, when I performed the operation, the base of the ulcer was formed by the periosteum of the malar bone, and its sides (which felt almost bony) were of considerable thickness. Towards the mouth, only the mucous membrane covered the indurated parts. The orifice on the cheek was about the size of a ten-cent piece. The edges were rather depressed than elevated, not red, and very friable. The whole of this disease was dissected out, and peeled off from the bone, leaving it bare, and with a large, deep, gaping wound. By some lateral cuts and a little dissection, the skin could be slid so as to cover about two-thirds of the wound, without tension. The microscopic appearances gave no indication of a cancerous affection. I saw this patient in May: the wound on his face was entirely healed, and no marks of disease there. An ulceration, however, still existed on the nose, and seemed disposed to extend on the inside. A sharp crayon of nitrate of silver was freely ground into it so as to destroy the tissues as deeply as possible.

CASE XXIX. — *Rodent Ulcer.* — J. O. S., 60 years of age, applied to me in August, 1863, for an ulceration at the root of the ala of the right side of the nose, which was the continuation of a disease of ten or fifteen years standing. It had commenced with an ulcer on the upper lip, which gradually extended to the present spot, healing behind, and contracting the lip so that the edge was now looped up, and nearly in contact with the nose.

I made various applications to the ulcer, both caustic and others, which only served to aggravate it; and I finally decided to operate.

The loop and hardened cicatrix, together with the ulcer, were completely and thoroughly excised. The edges of the lip were brought together so as to restore its original breadth. The wound healed rapidly, and the patient seemed to be entirely cured.

About a year afterwards, he applied to me again with a small ulceration, just within the ala of the nose. After various applications, without success, it was cut out, and at once healed. Two months afterwards, it re-appeared; and, extending both laterally and in depth, a third operation was performed, more extensive than those preceding. This was followed by an erysipelatous affection of his face; and this, subsiding, by albuminuria. He gradually, in the course of some weeks, fell into a comatose state, and died.

This patient was of a very florid complexion, his skin very thick, and easily disposed to inflame. Half of every year, he lived in a hot climate. The edges of the ulcer presented no appearance of tumor, as in cancer of the skin, but were sharp, and had a mealy look, easily broken down by the probe.

THE EYE.

CASE XXX. — *Cancerous Tumor of the Right Eye. Removal. Recovery.* — A gentleman, 73 years old, applied to me, April 14, 1862, on account of a tumor projecting from the right eyeball, between the lids, springing from the surface of the globe just below the iris. Between two and three

years before, he had what he supposed to be a cataract, which destroyed the sight of the eye. Afterwards, he scratched the conjunctiva with his nail. This was followed by a small pimple, which slowly developed into the tumor. He was finally led to ask advice, by the recurrence of frequent and serious bleeding from the surface of the tumor, and also by a severe pain over the eyebrow, which prevented him from attending to his business, and disturbed his rest at night. On separating the lids, the globe was found to be enlarged, and protruded from the socket; the pupil filled with a yellowish-white substance. Very large veins ran from the conjunctiva upon the tumor. He said he had had an apoplectic attack about three months before, at which time he fell upon the floor, striking the tumor, and causing a copious hemorrhage.

Operation. — An incision was made at the external angle of the eye: the eyeball was seized by double hooks, and removed by the scalpel and scissors. The bleeding was free, but was checked without plugging the orbit: two or three vessels were tied. He gradually and perfectly recovered, and lived a number of years afterwards, and died of other disease.

CASE XXXI. — *Melanosis of the Right Eye. Removal. Recovery.* — N. G., 27 years of age, entered the Hospital on March 10, 1859, for a tumor of the right eye, which commenced six years before as a slight opacity, attended with neuralgic pains; and, about four years after, a tumor appeared just below the cornea, seeming to spring from the conjunctiva. Caustics were applied, but only aggravated the disease.

When he entered the Hospital, the globe was enlarged, irregular in shape, the anterior chamber was obliterated, and behind the pupil a dark-colored substance was seen. Just below the cornea, two irregular tumors projected from the ball, between the lids, surmounted by a transparent membrane, and containing dark-colored contents. The whole eye was the seat of intense pain; and an operation for its removal was decided upon on this account, from the great irritation produced on the eyelids, and from its probably malignant character.

An incision an inch long was made at the external angle of

the lid ; the globe of the eye was seized by the double hooks ; a sharp-pointed bistoury was plunged in at one side, and, the eyeball being circumscribed with the knife, the removal was completed by dividing the nerve with strong curved scissors. The use of the straight, sharp-pointed knife in the operation is much preferable to the blunt bistoury usually employed, which is manœuvred with difficulty among the deep-seated tissues, and prolongs the operation. In the present case, after the removal of the eye, the tissues, which formed the bed of the globe, were cleared away with scissors. The operation, as is often the case, was followed by very profuse hemorrhage, which was easily stopped by forcing one or two sponges into the socket. Experience generally shows that an attempt to seize the vessels with forceps is useless, where the hemorrhage comes from such an obscure situation as the loose cellular membrane, deep in the socket.

The compressing bandage was removed on the following day ; on the third day, one of the sponges ; and on the fourth, the remaining one. The patient left for home in about ten days, in a good state of health, and entirely free from pain.

An examination of the disease by the microscope disclosed cancerous matter, with a melanotic coloring.

The patient presented himself at the Hospital, between one or two years after the operation, in a good state of health.

These two cases show that this formidable disease may be removed, with a prospect of prolonging life, and with great relief to suffering.

CASE XXXII. — *Tumor of the Orbit. Removal.* — March, 1850. This case was that of a gentleman, 69 years of age, who had been healthy previous to the commencement of his disease. Four years before, after exposure to a current of cold air on his face while sitting at a lecture, he felt a soreness at the upper part of the orbit of the left eye. Shortly a swelling appeared at this spot, which gradually filled up the socket, forcing the eye from its situation, so as to project it forwards and outwards, and prevent vision, except of objects on the same side.

The surface of the tumor was irregular, and covered by enlarged veins. It was tense, elastic to the touch, and its appearance at first was that presented by encephaloid disease when making its way out from the interior of the cranium. It had increased one-third within two months. On a careful exploration, an indistinct fluctuation was perceptible. There also projected from the upper part of the socket a small shelf of bone, which entered, and was incorporated with, its parietes. This led me to the belief that it might be a case of periostosis, and to advise an exploratory operation.

An incision was made through the skin and orbicular muscle of the eyelid. This at once disclosed a bony sac, which, on being punctured, discharged about four ounces of fetid pus. This sac, as far as possible, was dissected out. On carrying the finger upwards, no resistance was encountered for two inches above the margin of the orbit. The pressure of the fluid had apparently caused an absorption of the lower wall of the frontal sinus, and forced upwards that portion upon which the anterior lobes of the brain repose. Two openings could be distinguished within the cavity; one leading into the right frontal sinus, the other communicating, by a very minute opening, with the nasal cavities: the interior was lined with a delicate membrane.

After being once emptied, the cavity was again filled with pus, coming, as was supposed, from the other sinus.

It was estimated that from six to eight ounces of pus escaped from the tumor in the course of the day. His physician informed me, that, for some days after the operation, the discharge was "immense;" but it then gradually decreased. The eye nearly regained its natural position, and the sight was as good as ever. His health was unimpaired.

I have once or twice seen cases similar to the above, in which the eye has been partially forced from its socket by a bony cyst, successfully treated by a free incision, and removal of a portion of the parietes of the cyst.

THE EAR.

CASE XXXIII. — *Epithelial Cancer of the Rim of the Right Ear.* — A gentleman, 45 years of age, who had always led a very temperate life, but had been exposed as commander of a ship at sea, applied to me, in May, 1859, with a large overhanging epithelial cancer of the upper part of the rim of the right ear. It had followed pretty much the course of cancer of the lip, and very much resembled it. It caused no very serious inconvenience. For half an inch on each side, the skin was scaly, thickened, and dark-colored, as it appears in the commencement of this affection.

With scissors I removed the tumor, together with a portion of the cartilage of the ear, so as to be sure to include the whole disease. I allowed the wound to bleed freely for some time, without attempting to arrest it; for I have often observed, in operations about the ear, but more especially in those involving the lobe, that a very slight irritation of the wound, such as is given by the application of forceps, seems to rouse up the erectile tissue, and give rise to troublesome hemorrhage. In removing pendulous tumors produced by the irritation of earrings, and where sutures have been applied, I have been called to patients some hours afterwards, and found the ear in the neighborhood of the wound greatly swollen, the hemorrhage profuse, and issuing from the whole surface of the wound *en nappe*; and have been obliged to remove the threads, and make soothing and cooling applications. In the present instance, it was necessary to tie a number of arteries, and apply a little prepared flax, which has been found very useful in checking slight bleedings, and as an absorbent for dressing wounds.

This patient did well.

CASE XXXIV. — *Recurrent Fibrous Tumor of the Ear.* *Removal.* — June 9, 1865, a young man, 25 years of age, was struck by a ball in the left ear, in October, 1860, causing a flesh wound, to which adhesive plaster was applied. After two weeks, a small, hard tumor appeared at the seat of injury.

When this was the size of a pea, it was removed; and he experienced no inconvenience whatever till 1863, when, from the scratch of a stick, the tumor re-appeared. It was again removed in six months after the injury; and, in three months, re-appeared for the third time. It was about the size of a cherry, hard, well defined, embracing the helix of the ear, and apparently encondromatous.

It was removed by a V incision with scissors. Two bleeding vessels were tied, and the edges of the wound brought together by sutures. A microscopic examination showed it to be fibrous.

HORNS.

In the course of my practice, I have had an opportunity of observing four or five cases of horny substances developed on different parts of the body. In 1836 I brought home from Paris a wax model of the head of a woman, with a horny excrescence of from eight to nine inches in length growing from the forehead. It was removed, by the celebrated Dr. Souberbielle, from the head of an old woman; and, at my request, the operator wrote out a description of the case, he then being over ninety years of age. This case — to which I would refer as one of the most celebrated cases on record — has already been published in the "Transactions of the Boston Society for Medical Improvement."

Dr. William R. Lawrence, who obtained this account for me, writes underneath it as follows: "Dr. Souberbielle called upon me, and left the following description of the woman with the horn. It seems that he has never published an account of it. Dr. Souberbielle is a curiosity of himself: he is 92 years old, and is still an operating surgeon, in full health, and does not wear glasses; was an intimate friend of Robespierre; and says that he once examined Franklin for stone in the bladder. He says that he has performed the high operation for stone between fourteen and fifteen hundred times; and that that is the only one which ought to be performed, except in children."

M. Rayer, in his work on diseases of the skin, mentions the case of a woman under the care of Dubois, at the Hospice de

Perfectionnement, who had a horn occupying the forehead six inches in diameter and six inches in height. It was very hard at its summit, and was embraced at its base by a ring of epidermis, such as is seen at the root of the nails. This tumor gradually increased, so as finally to push down the skin of the forehead and cover the eyelids: a fetid odor arose from it.

I have seen one or two cases of tumors resembling these horny productions; one, on the face of an old lady, between two and three inches in height, with a base of an inch and a half or two inches in diameter, of a dark brown color, and of some years' duration. Upon using slight force, it came off in my hand, leaving at its base an ulcerated surface. The excrescence was evidently composed of dried layers of pus, originating in a chronic ulcer.

The following case of a true horn of small size I operated on in 1863:—

CASE XXXV.—*Horn on the Face.*—An Irishman, 60 years old, with rather a dried, shrivelled skin, presented himself at the Hospital, June 6, 1863, having a horny excrescence growing from the skin of the face, on the right side, and on a level with the edge of the lower jaw. The horn itself was rather more than an inch long, situated on an elevated base or tumor about half the size of a small English walnut. The whole growth was removed by two incisions, leaving the healthy cellular membrane below. A perpendicular section of this tumor displayed, — first, at the base, fat, forming the mass of this part of the tumor; second, this was surmounted by three-fourths of an inch of compact epidermic tissue, on top of which was the horny structure, disposed in cup-like layers.

I have also lately removed from the forehead of a female, just between the eyebrows, a horny tumor of about three-quarters of an inch in length, and of between one and two years' growth. It had at first the appearance of a wart, this being gradually surmounted with a horny production. It was removed as in the former case; and healed, hardly leaving a scar.

DEVIATION OF THE SEPTUM OF THE NOSE.

We seldom observe in books on surgery any reference to the question of the treatment of this affection; it being principally noticed in connection with the differential diagnosis of polypus, and mucous thickening of the nasal cavities. It is, however, an affection of some importance, and one in consequence of which patients often apply for treatment. It would be supposed, that what is lost in freedom of respiration by the obstruction on one side would be made up on the other; but this is not the case. The obstructed side becomes congested, and this congestion seems to be transmitted in part throughout the whole extent of the nasal cavities, causing difficulty in breathing, inordinate secretion from the nostrils, more or less congestion about the head, and a general disturbance of the health. Patients with this disease often apply for advice, supposing it to be polypus; and sometimes, from the great bulging-down of the spongy and thickened mucous membrane of the septum on one side, it would seem easy for the mistake to be made. But, on examining the tumor, it will be found, first, always to belong to the inner instead of the outer side of the nasal passage; secondly, on pressing on it with a probe, or with the little finger, it will be found unyielding; and, thirdly, by passing a probe into the other nostril, it will fall into the cavity made by the deviation, corresponding to the prominence on the other side.

The method which I have adopted for the treatment of these cases will be best illustrated by one or two examples, which may serve to represent quite a number of others which have fallen under my observation.

CASE XXXVI. — *Deviation of the Septum of the Nose.* — A child, 12 years of age, of a scrofulous habit, was brought to me by its parents, having an extreme deviation of the septum to the right side, completely obstructing the passage, and giving rise to the train of symptoms already mentioned as belonging to the severe forms of the affection. I commenced, with much difficulty and great resistance on the part of the patient, by

passing a small bougie into the obstructed nostril, keeping it upon the floor of the cavity, so as to prevent its penetrating either in an upward or lateral direction. After this had been done for several days in succession, a narrow passage was opened. Into this was passed a piece of prepared sponge, well oiled, about an inch long, of a cylindrical shape, and pointed at its extremity. This was secured on the outside with a string, which was fastened around the ear. The expansion of the sponge at first caused great irritation, which would have gone on to ulceration, had it not been removed after twenty-four hours. After the irritation had subsided, the sponge was again introduced; and, by proceeding with caution, and removing it from time to time, an opening was made large enough to allow as free a passage of air as upon the other side.

CASE XXXVII. — *Deviation of the Septum of the Nose*, — A young gentleman, 18 years of age, with marks of a strumous diathesis, consulted me on account of a deviation of the septum to the right side. He could breathe freely through the left nostril; but on the right side, he could, with great effort, force through only a small portion of air. The tumor formed by the septum looked much like a polypus, forced down to the external opening of the nostril. I first passed a bougie along the lower side of the tumor; then the little finger, well oiled, was very slowly, and with much difficulty, insinuated into the passage, forcing the septum over, and guided at the same time by a finger in the other nostril. On withdrawing the finger, he breathed freely through the right side. He was now advised to introduce twice a day a bougie; and at night to wear a little instrument constructed with a spring, so that it could be closed by pressing the blades together, and then allowed to expand after introducing it into the nostril. After this course had been pursued for a short time, the passage seemed to be fully dilated; but, on its being neglected for several months, the difficulty recurred in part, so as to require a repetition of the treatment.

CASE XXXVIII. — *Deviation of the Septum Nasi, with apparent Calcareous Deposit on the external end of the*

Cartilage. — A boy, aged 12, was brought to me, June 24, 1866, by his physician, for what appeared to be a tumor in the right nostril, and which bulged out the side of the nose. It had come on gradually, finally completely obstructing the breathing through that nostril.

I found it to be the affection mentioned above. The surface of the tumor had on it one or two streaks which looked like ulceration, but which, on being examined with the finger, proved to be calcareous deposit on the end of the cartilage, where it pressed on the mucous membrane. At first, there seemed to be no visible opening into the nostril; and it was with some difficulty and with great resistance from the patient, that the probe could be insinuated along the floor of the nostril. This was replaced by a conical gum-elastic catheter, through which he breathed freely. I advised the treatment pursued in the former cases.

TUMORS OF THE JAW-BONE.

In the substance of the superior and inferior maxillæ are found tumors of various character, myeloid, cystic, cancerous, fibrous, cartilaginous, and osseous; more superficially, and springing from the bone, may occur epulis.

Operations for the removal of large tumors of the jaws were formerly very rare, and were considered highly dangerous. By the use of improved cutting forceps of large size, the upper jaw-bone may now be removed with but little trouble or danger; being, in fact, a less formidable operation than the excision of the lower jaw. The deformity, too, is much less than might be expected; as the cavity is, in a measure, filled by adventitious tissue, and may also be partly closed by artificial contrivances.

MYELOID TUMORS OF THE JAW. — Myeloid tumors in the jaw are rare, and, at a late stage of their existence, are often distinguished with difficulty from that external affection called "epulis." The following cases characterize well the history and appearance of this disease.

CASE XXXIX.—*Myeloid Tumor of the Lower Jaw.*—A lady, 21 years of age, applied to me in 1861, with a hard tumor on the right side of the lower jaw, in front of the socket of the second molar tooth, which had been extracted a couple of years before. Since its extraction, she had had neuralgic pains in that side of the face. The tumor had somewhat the feeling of a cystic growth. There was no disease of the gum. I cut down upon it, and removed it even off with the jaw with the bone forceps. The wound rapidly healed; and I did not see her for a year, when a slight bulging-out of the jaw was perceptible at that spot, but not sufficient to demand surgical interference. In November, 1865, she consulted me for a fungoid growth resembling epulis, occupying most of the horizontal portion of the jaw on the right side, which had appeared within the last three months. The lower edge of the bone still preserved a clean margin. It was decided to expose the disease by a free external incision, and to be governed by circumstances as to removing the whole substance of the jaw, or leaving the lower rim of bone. This was done in the manner related in the next case, and the tumor exposed to view: the facial artery was tied before being cut, to avoid the great and troublesome flow of blood which usually takes place when that vessel is divided. A tooth was now removed in front of the disease, and the wisdom-tooth behind; and, it being found possible to preserve the edge of the jaw, perpendicular incisions were made with a small handsaw, a horizontal groove underneath the tumor with Hey's saw, and the division was completed with powerful bone forceps. On removing the tumor, a small cup-like depression remained in the centre of the place from which it was taken; and, although this appeared quite healthy, as a matter of precaution it was scooped out with a chisel.

On making a section of the tumor, the bone was found expanded to a shell, and contained a soft material similar to that to which the name of myeloid has been given, of a soft uniform appearance, and which, on examination with the microscope, proved to be a fine specimen of that disease. It had broken out from its osseous envelope on the outside, and then had spread rapidly over the gums in the vicinity.

The wound was brought together by quite a number of sutures, and united nearly throughout by first intention. The patient had scarcely any constitutional disturbance.

CASE XL. — *Myeloid Disease of Lower Jaw.* — A young married woman, 19 years old, whose general health had been very good, consulted me, in June, 1865, for a tumor of the lower jaw. It had commenced, two years before, with pain in the first molar tooth of the right lower jaw, which was thought at the time to be due to an "ulceration of the tooth." A swelling, which made its appearance a year and a half after, gradually increased. The tooth was then extracted: in the course of six weeks the tumor doubled in size. It was easily felt externally, extending from an inch from the angle of the jaw to the canine tooth. On the inside of the mouth it bulged out, and protruded upwards through the cavity formerly occupied by the tooth. She had little or no pain, and experienced no inconvenience from it. Her general health was very good.

Operation. — An incision was made from the zigoma, sweeping around under the ramus of the jaw, and terminated near the lip in front of the angle of the mouth. The facial artery, which was now exposed, was seized, with two pairs of forceps, above and below, divided between them, and the two ends tied. The mucous membrane was now cut through into the mouth, and the tumor exposed. The teeth in front and behind being extracted, the jaw was sawed through with a small saw, and was then dissected out.

On examining the tumor, the walls of the jaw were found expanded by the growth from within, and deficient at the upper portion, where it protruded. On making a longitudinal section, the gross appearances were found to be characteristic of myeloid disease; being compact, uniform in appearance, with a few of the characteristic "blotches."

Under the microscope, there were found elongated and many nucleated cells.

The wound healed rapidly; but her health remained delicate for some months afterwards.

CASE XLI. — *Removal of Upper Maxillary Bone for Myeloid Disease. Palliative Operation two years before. Artificial Substitute.* — A young man, 19 years of age, entered the Hospital, April 7, 1864. He was formerly a soldier. A year and a half before, a small swelling was noticed upon the outside of the gum of the upper jaw, near the first molar tooth, following too early exposure after an attack of typhoid fever. Thinking a carious tooth was the cause of the swelling, it was removed; but this had no effect on the tumor. Nine months after, it began to increase in size: on admission to the Hospital, it measured one and a half inches in diameter; was ovoid, hard, not tender upon pressure; painful at times, pain "streaming up" the side of the face, and at such times the eye was frequently bloodshot.

April 9th, he was etherized; the lip was drawn up, exposing the tumor. An incision was then made in the protruding wall. Through this opening, the finger was passed into a cavity containing a pulpy substance, which partly filled the antrum, and which was scooped out.

A fragment was examined under the microscope, and found to contain the many nucleated plates of myeloid growth, and distinct, isolated nucleated cells, such as are usually found in the same connection.

Sixteen days after, he was discharged, relieved.

Nov. 29, 1865, he returned again for the removal of the upper maxillary; the disease having recurred, and made considerable progress. The right side of the cheek was occupied by a hard tumor, expanding the anterior wall of the antrum, and impinging on the malar bone. The aperture previously mentioned was filled with a dark-colored, fungoid mass, of the size of a chestnut. It was decided to remove the whole bone, as affording the only hope of cure. It was done in the following manner, which I shall describe in detail, as being the method which I have ordinarily pursued for the removal of the upper maxillary bone, and which leaves as little deformity as any of the methods proposed, where the disease is extensive. Being etherized sufficiently to carry him through the preliminary incisions, a pointed bistoury was plunged through the skin just

above the zygomatic process of the malar bone. A curved incision was then made through the skin and muscles to the angle of the mouth. A bit of sponge had been previously stuffed into that cheek to prevent the blood from flowing into the fauces. When the skin of the face is more flaccid, as in old persons, this incision may be commenced lower down, thereby dividing fewer filaments of the facial nerve, leaving less paralysis. A too limited incision, however, embarrasses the section of the bones. The flap was dissected rapidly up, the right ala of the nose cut away, and the contents of the socket dissected partially from the floor of the orbit. The bones being well cleared, the vessels in the flaps were tied, the blood was cleared away from the wound, and ether was again given. With a small hand-saw, a groove was made in the frontal process of the malar bone and through the zygomatic process, and the section completed by the cutting forceps, the former incision extending into the spheno-maxillary fissure. The nasal process of the superior maxillary bone was now cut through in the direction of the same fissure. The mouth being held wide open, a vertical incision was made with a strong pointed knife, through the coverings of the hard palate as far back as the palate bone, and a lateral one from the termination of this behind to the root of the last molar tooth. Liston's large cutting forceps were now used to divide the bone, which they cleanly and efficiently did; the first incisor tooth having been previously removed. The whole mass was now seized with powerful hooked forceps, and an attempt made to depress it; but it held fast at its junction with the pterygoid process of the sphenoid. A chisel was therefore driven in behind the bone, and an attempt made to break its attachments, but without success. A blunt chisel was then inserted between the two maxillary bones; and, by a prying motion, the adhesion to the bone behind was broken. The remaining soft attachments were divided by blunt curved scissors. The maxillary artery, which bled freely, was tied. When all hemorrhage had ceased, the edges of the skin were accurately brought together by sutures, care being taken to nicely adjust the lip; and one or two sutures were inserted inside the mouth.

The patient was greatly depressed, and stimulants were freely

administered. There was an oozing from the wound during the same day. For some days the pulse remained feeble and the strength much depressed. In two weeks the powers of life revived, and he then recovered with great rapidity. The paralysis was less than usual, and with a slight effort the eyelids could be nearly closed. Sight was not impaired. The union of the wound was perfect, except at one small spot, where a salivary fistula seemed to threaten.

On inspection of the diseased part, the cavity of the antrum was found filled with a soft, dark-colored, spongy mass, which, under the microscope, presented the well-marked characters of myeloid growth. The disease was entirely removed by the operation.

Remarks. — The incisions in the soft parts in this case leave as little deformity as any of those suggested for the excision of this bone. Gensoul recommends incision of the upper lip, a cross cut through the cheek, and a perpendicular one at the end of this, leaving three very disagreeable scars. Fergusson, a simple cut through the upper lip into the nostril, or, possibly, a continuation of this incision around the margin of the ala, up the side of the nose, and along the edge of the orbit, if necessary. In regard to the bones, it has been advised to make one cut through the maxillary process of the malar bone into the speno-maxillary fissure, instead of dividing the zygoma and the frontal process of the malar bone. The objection is, that the tumor generally occupies the whole cheek, and prevents the execution of the plan proposed. The trying point is the adhesion of the maxillary bone to the pterygoid, made more firm by inflammatory action, so that in malignant diseases, in attempting depression of the bone, the front part of the antrum is apt to break away from the posterior portion, requiring the back part to be subsequently removed.

The slight deformity left from so extensive an operation is remarkable. There is a slight paralysis in the cheek, and at first a confusion in the speech and some difficulty in deglutition, which can be almost completely remedied by artificial appliances of gold, gutta percha, or hard India-rubber.

With a little management, a much larger portion of the soft

parts covering the palate might be saved, as they peel off easily when the bone is depressed.

This patient recovered perfectly. The salivary fistula, which, it was feared, would be permanent, closed after two or three applications of caustic. The voice and deglutition were, of course, very much impaired by the great cavity left after the removal of the bone. These, however, were completely restored by the ingenious construction of a hard rubber obturator and palate, made by Dr. Rufus E. Dickson, dentist. He now speaks well, and liquids no longer regurgitate through the nostrils.

EPULIS. — It is necessary to distinguish epulis from myeloid disease of the jaw. The latter is usually a disease of the interior of the bone, which, extending outwards, after a while presents an appearance similar to the former. Myeloid disease, involving the substance of the bone, and changing entirely the structure of the part, as is well described by Paget, requires the excision of that portion of the jaw which is attached.

Epulis is comparatively superficial. It arises from the periosteum and grows outward; is more common in young persons, though it frequently occurs in advanced life. If the gum is removed with the sockets of the teeth from which it springs, the disease is cured; but care should be taken to cut deeply enough into the bone to remove the whole, as otherwise it will be likely to return.

In the case to be adduced, the disease had become so deeply seated, and attacked to such an extent the neighboring parts, that removal of the whole bone, which was very small and delicate, was finally required.

CASE XLII. — *Removal, through a Small Opening, of Half of the Lower Jaw-bone. Epulis.* — A married lady, 30 years of age, consulted me, in June, 1860, for a fungous excrescence occupying the alveolar processes, and sockets of the three last molar teeth. The disease ran up a little on the ramus of the jaw, and lapped over on each side. A year previous, she had submitted to the removal of a molar tooth, and the jaw had

not since been in a sound state. A short time afterwards, a fungous growth from the diseased socket was removed. It gave her very little pain, but was increasing, had taken in the mucous membrane on the outside of the jaw-bone, and was creeping up on the ascending part of it. She was desirous to have an operation done at once, so that she might return home that day. This I did, as thoroughly as possible, in the ordinary way, with the cutting forceps, going deep into the jaw, and removing the disease so far as it could be detected. The bleeding for the moment was profuse, obscuring the after steps of the operation, as it always does when an attempt is made to cut away pieces of the jaw, without making an opening through the cheek; and on this account the subsequent safety of the patient is often sacrificed to the natural desire of avoiding a deformity. The hemorrhage was checked by the local use of perchloride of iron. In a fortnight I saw her again, every thing apparently having done well.

On a very careful examination at this time, I detected, deep in the jaw, remains of the diseased tissue, and, knowing that any delay would be fatal, proposed to the patient an operation for the exposure of the bone by an external incision; and, if it was then found necessary, the removal of the whole bone. Being a person of great courage and decision, she at once consented without hesitation to submit to any operation that was thought necessary.

On the 20th of June the jaw was exposed. What was left of it was found to be very narrow, and invaded by disease, which ran up on the ascending ramus. It was at once decided to disarticulate the bone, which was done in the usual manner.

The wound united by the first intention. The constitutional irritation was slight. On the fourth day she sat up, and on the sixth was out of doors; on the eighth she returned home, a distance of eighty miles. A daguerrotype likeness taken at this time scarcely shows the marks of the operation.

November, 1863, being in town, she called on me. She was in full health, and was free from disease. She talked plainly; and used the remaining portion of the jaw well in mastication. The gap caused by the removal of bone was filled up with

dense fibrous tissues, which seemed to answer all the purpose of bone for steadying it. The incisor teeth above and below were in apposition. There was no paralysis; and the marks of the operation were scarcely visible.

CYSTIC TUMORS OF THE JAW. — The appearance of these tumors is generally very formidable; and the practice, for the most part, when the whole substance of the bone is dilated into a mere sac, almost entirely deprived of osseous substance, has been, until very recently, to remove the portion of the jaw involved by the tumor. When the tumor has grown simply at the expense of the outer table of the bone, either of the upper or lower jaw, without involving its whole substance, it has been customary to explore the cyst and remove a portion of it, causing inflammation and obliteration of the cavity, as in the case of cysts occurring in soft parts. Dupuytren, in his collected articles on Diseases of the Bones, has attached more importance to this question than any other writer; and illustrates, by cases, the effect of exposing the tumor by external dissection, removing a portion of the sac, and by applications effecting its obliteration. Professor March, of Albany, has written a valuable paper on this subject in the "Transactions of the Medical Society of the State of New York." Professor Gross and others have suggested the idea, that, in the large cysts which involve the whole bone, and which formerly were known under the name of "spina ventosa," the treatment should be the same. In one of the cases cited by the former gentleman, the extirpation of the bone was finally found necessary after this plan had been tried.

As to the causes of these diseases, they are various. In the jaw, they probably arise, in most instances, from irritation at the roots of the teeth; in the long bones, the head of the tibia for instance, from blows.

In 1862, I published, in the "Boston Medical and Surgical Journal," a case occurring in an elderly woman, of a cyst which involved the ascending portion and condyles of the jaw, and which I removed; not thinking it safe, in a person of her age, when the disorganization of the jaw seemed to be so complete,

to run the risk of an experimental mode of treatment. Since that time, I have had an opportunity of trying the conservative plan of treatment in two instances, which I propose shortly to relate.

Notwithstanding the principle which has been suggested or hinted at for the treatment of large cystic tumors of the jaw, none of the writers on the subject have presented cases,—where complete destruction of the bone has taken place, leaving nothing but a delicate cyst,—as having been successfully treated by the method adverted to. Dupuytren, in his work on Diseases of the Bones, gives several cases treated without excision; some of them, however, unsuccessfully. M. Nélaton has also written on the subject, referring for cases to the work of Dupuytren, and advising the puncture of the cyst, and the stuffing of its cavity with lint. Mr. Erichsen says, that, "when the cysts are so large that they have destroyed the integrity of the bone, or when they are associated with a large quantity of fibrous tissue, so as to constitute true fibro-cystic tumors, excision of the diseased bone must be practised." Mr. Stanley, in his "Treatise on the Diseases of the Bones," describes perfectly the affection, but does not allude to any other operation than the "removal of the tumor, and of the portion of the bone from which it has arisen."

In the following cases, the treatment consisted in the puncture of the sac within the mouth; evacuating its contents, and, at the same time, obliterating the cavity by crushing in its walls; and, lastly, in keeping up, by injections, &c., a sufficient degree of irritation to favor the deposition of new bone. The comparative mildness of this mode of treatment, and the excellent character of the results, combine to award the preference for this operation over excision, or even the large external incision adopted by Dupuytren.

CASE XLIII. — *Cystic Tumor of the Lower Jaw.* — A young woman, aged 25, with light hair, blue eyes, and delicate skin, applied to me in the spring of 1862, on account of a large tumor involving the whole right side of the jaw above its angle. The tumor was of a globular shape, extended back under the lobe

of the ear, forwards so as to encroach upon the cavity of the mouth, and upwards so as to press upon, and somewhat to overlap, the zygoma. The external surface of the tumor was smooth and shining, slightly œdematous; and she suffered from its pressure upon the surrounding organs. It had commenced, some years before, by a swelling at the root of the wisdom-tooth of the right side; and the inconvenience caused by its pressure had become so great as to lead her to take measures for its removal.

Upon consultation, it was decided that a portion of the jaw would probably require removal; the tumor having been first exposed by an incision made inside of the mouth, to verify its character.

The following operation was performed under the influence of ether. An incision was made in the most prominent part of the tumor in the mouth, upon which a large quantity of glairy fluid escaped. Upon passing the finger into the opening, it was found that the whole jaw at this point, with the articulating and coronoid processes, was expanded into a mere shell, at some parts as thin as parchment, and destitute of osseous substance. It was without solid contents. Under these circumstances, and considering the good health and youth of the patient, it was determined to make the attempt to save the jaw. A portion was therefore removed from the sac; and, with the fingers, the sides of the cavity were made to collapse, so as to come in contact with each other. In order to excite still farther irritation, a bit of cotton cloth was forced into the interior, and the end left projecting into the mouth. A moderate degree of irritation followed; and, at the end of a day or two, the pledget was removed, suppuration having commenced in the sac. The aperture was dilated, from time to time, by the introduction either of the finger or of a bougie, and the sac injected with tincture of iodine. At the end of two or three weeks, she left the Hospital, with the tumor reduced to about one-half its original size. From that time until the present, she has occasionally visited me at my house; and, by keeping the external opening free, and occasionally irritating the interior of the sac, a solid mass of bone has been deposited anew, and the jaw has resumed

somewhat of its original shape. The sac is in the way of becoming entirely obliterated.

In November, 1863, I again saw the patient, who came to consult me, not about herself, but about a friend. All signs of the tumor had disappeared, and the jaw had regained almost its natural shape; but a small aperture still existed at the site of the former opening into the mouth, and a glairy fluid was occasionally discharged from it. She was quite well, and all the functions of the jaw were perfectly performed.

Subsequently, she applied to me with a tumor of a smaller size, which had appeared in the jaw anterior to the site of the first one. It was treated in a similar manner, with a similar result.

CASE XLIV. — *Cystic Tumor of the Lower Jaw.* — May 23, 1863, Dr. Bennett of Uxbridge, Mass., brought me, as a patient, a gentleman 56 years of age, with a large tumor on the right side of the face, occupying the parotid region. He was pale and sallow, much emaciated; and his aspect at first struck me as that of a person suffering from malignant disease. He said that, five years before, while eating, he had the sensation of something giving way in the neighborhood of the ascending ramus of the lower jaw. Shortly after, a tumor appeared in that region, which had slowly increased to its present size. Before making an examination, it was not easy to say whether the tumor was connected with the parotid gland or with the jaw. From the commencement of the disease to the present time, mastication, and, for a good part of the time, deglutition, had been much interfered with. The tumor had been examined by many physicians of experience, and by most of them considered as a parotid tumor, and as the patient inferred, although he was not directly told so, of a malignant character. It extended backwards into the parotid region, upwards upon the face, and inwards so as to occupy the right half of the palate; and was covered with a highly irritable mucous membrane, somewhat œdematous, and similar to what we often see investing malignant tumors in the mouth, which have made their way through from the neck. During an examination, the patient said there

had been of late a slight discharge of fluid into the mouth; and, on making a careful inspection, a minute aperture was detected at the point where the last molar tooth had been removed.

On introducing a probe at this point, a jet of serum, mixed with flakes of lymph, was projected to a considerable distance. I immediately enlarged the opening with the knife, so that I could introduce the finger. This was a matter of some difficulty, however, as the patient's jaws had been for a long time nearly closed in consequence of the disease. The finger penetrated into a large sac, extending far out of reach; and, on investigation, it soon became evident that the whole tumor was formed by the expansion of the jaw, from the development within it of an immense cyst. On withdrawing the finger, a barrier of bone was felt, extending across the jaw; and behind it, under the first molar tooth, another smaller sac was discovered.

I now decided to treat this case in a similar manner to the preceding one. An oblong piece of about an inch in length and half an inch in width was removed, by scissors, from the wall of the cyst; and with a finger of one hand in the mouth, and a finger of the other on the outside of the face, the sides of the cyst were broken down, giving way under the pressure like parchment, with a crepitating noise. The projection of the tumor on the face, as well as within the mouth, became in a great measure effaced. There was a slight but unimportant effusion of blood. The patient returned home, under the charge of his physician, with the intention of pursuing pretty much the same course as was adopted in the former instance. On account of his age, and the debility caused by the want of proper nourishment, owing to the difficulty of mastication, he was ordered tonics and a nutritious diet.

About four weeks later, I saw him again. Every thing had gone on well: the tumor was not more than a fourth as large as formerly, and ossification had commenced in the walls of the sac. His health was wonderfully improved, and his complexion had assumed a healthy hue.

Dec. 8, 1863, I saw him for the third time, so altered for

the better as scarcely to be recognized as the same person. The jaw externally had resumed its natural shape; and, on examination with the finger, its distinctive anatomical marks and processes could be felt. On the inside of the jaw, where the incision had been made, a deep sulcus was observed, lined with mucous membrane, into which a probe could be passed into the ascending ramus. There was no discharge to be detected, and the power of mastication was as good as ever. The only trouble he experienced was from the lodgment of food in this cavity.

Three months later, he was seen with the jaw in a perfectly healthy condition, performing all its functions; and the only change from the normal state was, perhaps, a more solid and somewhat thickened condition than natural, with the sulcus existing at the back part, where the tumor had originated.

In 1866, he made me a visit, as he said, to show the complete success of the operation.

CASE XLV. — *Cystic Tumor of the Upper Jaw.* — A young lady, 16 years of age, of English parentage, was brought to me, in May, 1865, on account of a tumor which had been developing for the last three years in the alveolus of the right upper jaw, just above the canine and bicuspid teeth. Three years before, the nerve of the canine tooth had been destroyed by arsenic, and the carious cavity filled with gold; the first bicuspid being also filled at the same time. Irritation soon commenced at the roots of these teeth; and gradually, and almost imperceptibly, a swelling appeared there. A month before she came to me, this tumor opened at its most dependent part, discharging a glairy fluid, which continued to exude until I saw the case.

The aperture admitted a small probe, which penetrated into a deep, smooth cavity. With the finger, the tumor from below appeared firm; but, when pressed upon under the gum, a degree of elasticity was distinguished.

I informed the parents of the young lady, that the disease was a cystic tumor of the bone, and advised an operation. This was assented to. The patient was etherized, and a cut made

into the tumor. The mucous membrane was then dissected up from its surface, so as to expose so much of the bony sac as would admit of a free opening being made into it; and a portion of the bone was removed with scissors. The finger could now be passed freely into the cavity, which was quite smooth, and entirely lined with membrane: it was not penetrated by the roots of any of the adjacent teeth. The cavity was stuffed with lint, in order to excite inflammatory action, for the purpose of obliterating the sac.

The operation had all the effect that could have been desired. In the course of a couple of months, granulations filled up the the cavity, entirely obliterating it.

She was completely relieved of the disease.

One or two other cases of cysts in the upper jaw, I have treated in the same way, with a similar result.

CASE XLVI. — *Removal of the Lower Jaw for a Cystic Tumor. Subsequent Ligature of the Carotid Artery.* — Mrs. W., a widow, 49 years old, had had the wisdom tooth of the right side of the lower jaw extracted about twelve years before I saw her: the socket remained quite sore for some time after the removal of the tooth. Six years after, the angle of the jaw began to enlarge; and the bone gradually expanded so as to form a tumor the size of a hen's egg, which encroached upon the cavity of the mouth, and displaced the tongue and other organs. The tumor was slightly elastic to the touch, and had become a little tender on pressure; with this exception, there was no pain, and no inconvenience in mastication. The disease involved the angle and ascending ramus of the jaw, and extended forwards as far as the second bicuspid tooth.

March 30, 1861, the portion of the lower jaw behind the second bicuspid was removed in the usual manner, though when the bone was seized with strong forceps, in order to raise it from its adhesions to the surrounding parts, on the application of a very slight degree of force it gave way, and disclosed the fact, that the whole angle, the ascending ramus, and the processes of the jaw, had become reduced to a sac or cyst containing a thick yellow fluid. The operation was finished, for the most part, by

the fingers ; and the lingual nerve, which lay close upon the inner surface of the tumor, was dissected out and saved. Several vessels were tied ; and the edges of the wound were brought together by sutures, three of which were placed inside the mouth.

No severe constitutional disturbance followed the operation ; and on the third day the wound was nearly united. Two days later, the face swelled, and the wound began to discharge pus. In the course of another fortnight, the wound had healed, with the exception of a small opening at its lower angle. On the 17th of April, a slight hemorrhage, of perhaps two ounces, took place from this opening ; and on the night of the 27th, when the patient had so far recovered from the operation as to think of going home, profuse bleeding occurred, which was with difficulty controlled by a sponge and compresses. On the 29th, it became evident that the hemorrhage could not be controlled, by even the most careful plugging of the wound ; and the ligature of the carotid artery seemed to offer the only chance of saving life. The patient was therefore etherized, and the sponges removed from the wound. The finger passed readily from the external aperture, corresponding in position to the angle of the excised jaw, as far as the glenoid cavity of the temporal bone, which felt rough and carious. Pressure upon the carotid artery of the affected side diminished the bleeding, but did not entirely check it ; and no greater effect followed the compression of both carotids. The artery was tied at the middle of the neck, after a somewhat tedious dissection, owing to the œdematous state of the tissues. A slight oozing of blood continued ; but it was easily arrested by forcing a piece of sponge deep into the wound in the direction of the bleeding vessels. On removing the patient to her bed, it was noticed that the side of the body opposite to that upon which the artery had been tied had become completely paralyzed. The paralysis gradually diminished as the strength of the patient improved ; and, on the 14th of May, the ligature of the carotid came away. The sponges had been previously removed from the wound, which healed rapidly. An abscess, which formed behind the ear, did not delay the cure ; and, on the 24th of May, the patient was discharged, cured, but still somewhat feeble.

It should have been remarked, that, prior to commencing the operation on the jaw, it had been decided to uncover the tumor, and, if the cyst was found but partially to occupy the bone, to
* remove a portion of it without removing the whole bone. It was evident, however, as soon as the tumor was exposed, that all the bony tissue had disappeared; and its place had become occupied by a thin and almost transparent cyst, of the consistency of parchment, the coronoid and condyloid processes making a part of it. The removal of the whole bone was therefore performed.

The effects of the ligature of the carotid were quite remarkable. The current of blood was sufficiently checked to allow of effectual plugging, which before would not stem the current of blood. The effect on the brain was certainly very singular. A hemiplegic affection, three or four days after the ligature of the carotid, is not uncommon; arising, probably, from an inflammatory action taking place in the substance of the brain. In the present instance, the paralysis was immediate, and must have arisen from the sudden diminution of the supply of blood to the brain, following upon the great drain to which the system had been subjected a few days before.

The patient has been heard from lately, having perfectly recovered her health.

CANCEROUS TUMORS. — Cancerous tumors of the jaw present all the characteristics of that growth as seen elsewhere; nor are they very rare. They are more frequently found in connection with the upper than the lower jaw, and generally commence in the antrum. Being concealed within the bone, they often make their way into the nasal passages, and increase to a considerable size before they appear through the bone externally; and for this reason it is difficult in the earlier stages to decide whether the disease is malignant: when, however, the tumor has protruded beyond the walls of the antrum, and when it is situated in the lower jaw, the diagnosis is less difficult.

Two or three cases are given in illustration: —

CASE XLVII. — *Removal of the Upper Maxillary Bone.*
— Mrs. G., aged 49 years, applied to me in September, 1857, for a tumor of the left upper jaw-bone. She was a small, thin woman, of a delicate constitution, and somewhat sallow complexion. She knew of no hereditary disposition to cancer. She was the mother of several children.

For three years she had perceived a fulness of the cheek-bone, and there was at the same time a slight and constant discharge from the nostril of that side. This continued, and the swelling increased, until July, 1857, when she suffered so much from it, that her physician punctured the antrum, after having extracted a tooth. At the time there was a slight hemorrhage; but three days afterwards a copious discharge of pus took place, which continued in varying quantities. When the discharge was small, there was much fulness and pressure about the antrum, which was relieved by an increased flow.

The whole upper jaw-bone seemed to be enlarged. The tumor had not made its way into the mouth, but seemed disposed to do so into the cheek, the integuments of which were reddened and a little œdematous. I advised an operation as affording the only chance for relief from suffering, though its ultimate success was doubtful; letting her and her friends understand fully its advantages and disadvantages. It was decided that the operation should be done.

It was performed in the usual manner, as has been before related, the palatine bone and soft palate being preserved. In depressing the bone after its attachment had been divided, a portion at its posterior part was found adherent, and was left attached to the pterygoid process so as to require removal by the chisel. This circumstance I have, once or twice, seen happen in removal of the superior maxillary bone; the natural adhesion of the part being almost increased to ankylosis by the inflammatory action, which had been going on in its neighborhood. It is of so frequent occurrence, that it might be well in every case, as recommended by Dr. J. C. Warren, to pass a chisel behind the bone, and loosen it by two or three blows of the mallet.

She had a very good recovery, and returned home about three

weeks after the operation in good health and spirits. She continued well for a time, but has, I believe, since had a return of the disease.

CASE XLVIII. — *Malignant Disease of the Upper Jaw. Removal.* — In April, 1859, Mrs. N. M. applied to me for a tumor which had existed about five months. It commenced a few weeks before the birth of a child. The tumor occupied nearly the whole of the upper maxillary, pressing down the palate, extending from the root of the canine back to the last molar. Externally, the swelling extended quite back to the ear. The whole bony margin of the orbit was lost, and its place supplied by an irregular swelling. The pupil was turned upwards. No tumor could be perceived in the nostril. The skin over the tumor was movable, but tense and glossy. There being no doubt in regard to the malignant nature of the disease, an operation was decided upon.

The incisions were made a little differently from those I have usually practised, on account of the extension of the disease so far backwards. The first incision commenced midway between the orbit and auditory passage, and extended in a semi-circular form to the angle of the mouth, with a very broad, backward sweep; instead of commencing just back of the orbital process of the superior maxillary. In depressing the bone, after the usual divisions, the fingers were used, as it was so degenerated by the disease as not to allow a firm hold with forceps. After removal, it was found that the cancer had penetrated into the pterygoid fossa. This was scooped out with the fingers, and a hot iron applied.

The eye regained its natural position, and the wound healed without unpleasant symptoms. In a fortnight she left the Hospital, and returned home.

CASE XLIX. — *Removal of half of Lower Jaw for Cancer.* — James W., 56 years of age, applied to me in the early part of September, 1859, for a tumor about the size of a hen's egg, occupying the angle and horizontal part of the right side of the lower jaw. The disease had commenced twelve years

previously, with a numbness in the jaw, followed by swelling. Three years before, the pain in it became excessive, when an opening was made with a lancet, and a discharge of fluid took place, attended with relief.

When I saw him, the outlines of the jaw had disappeared; and the place was occupied by a smooth, round, shell-like tumor, which extended from the canine tooth backwards, rising a little upon the ramus of the jaw. The tumor projected inwards, pressing upon the tongue, lifting up the palate, and obstructing about one-third of the aperture of the fauces. His health was pretty good. He suffered principally from the obstruction to deglutition, and the affection of the voice. The disease thus far did not seem to have invaded the soft parts.

There appeared, therefore, to be no question as to the propriety of its removal: the only doubt was, whether to remove the jaw at the articulation, or saw off the bone just below. The principal objection to disarticulation, where the tumor is large, is the division of more or less of the filaments of the facial nerve. The objections to sawing off the bone in its ascending ramus, given by some surgeons, is, that the remaining fragment is drawn forward by the pterygoid muscles, and afterwards produces irritation. This I have not found to hold good in practice. In this case it was decided to disarticulate, the operation being performed as in previous cases. While continuing the dissection, however, after the facial artery had been cut and tied, it was cut a second time, although the incisions were not carried any further below than before. The tumor had lifted it out of place. I mention this fact to show how the best concerted plan may be frustrated by the anatomical displacement of the parts, induced by the growth of tumors in their neighborhood. The flow of blood was arrested at once: the patient became quite faint, and was obliged to be placed in the horizontal position for a few moments. This is worth mentioning, as it so rarely occurs in the course of surgical operations where the patient is kept up by the stimulus of the ether; and, previous to the introduction of that agent, it probably occurred as often from the exhaustion of the system by pain, as from the loss of blood. The separation and disarticulation of the diseased portion was completed as usual.

He had scarcely a bad symptom ; and the wound was almost entirely healed at the end of two weeks, when he left town.

On making a section of the tumor, with the saw, the jaw was found expanded into a shell, the contents being a soft gray matter.

It may be worth mentioning, that, in depressing the jaw for disarticulation, although done with great care, the ramus partly gave way in the tumor ; against which occurrence a caution is given in some works on surgery. The facial nerve, and, so far as could be ascertained, the parotid duct, seemed to have escaped the incisions ; the dissection for the disarticulation of the bone being made as far as possible from the inside, after the tumor was sufficiently freed from the soft parts.

FIBROUS TUMORS. — Fibrous tumors on the jaw are rare, though they occur here more frequently than on other bones. As described by Paget, they are round or oval, lobulated, dense, and heavy. They are almost uniformly white, and occasionally contain minute spiculæ of bone.

CASE L. — *Removal of the Upper Maxillary Bone for Fibrous Tumor.* — In the summer of 1857, I was requested by Dr. Edward Reynolds to visit with him, in consultation, a patient who was suffering from an affection of the left upper jawbone. Some months before, the disease had commenced by an irritation in the neighborhood of the left lachrymal passage, which produced an obstruction and an overflow of tears. This was followed by an increase in size of the upper maxillary bone : finally, an aperture appeared in the alveolar process of one of the molar teeth, through which there was a discharge of blood.

In the left nostril, there was a polypoid tumor ; and there had been one or two bleedings from this point. A probe was passed into the opening in the mouth, which penetrated deep into the maxillary sinus, and was followed by a free discharge of blood. The patient being rather low in health, and proposing to make a visit to her friends in Maine, I provided her with instructions ; and she agreed to see me again in the course of three or four weeks.

At the expiration of the time appointed, she returned to Boston, improved in health. The tumor in the nostril, however, had increased, as well as the distention of the maxillary sinus; and she had suffered from one or two severe hemorrhages. During the following week, a bleeding of so severe a nature took place, as to render it necessary to have some active surgical procedure at once adopted.

Before making my decision, I passed a finger into the nostril, which disclosed a large opening into the maxillary sinus, from which the tumor in the nose seemed to have projected. The jaw, in the neighborhood of the aperture in the mouth, had, since the last examination, three weeks before, been more or less forced downwards into a rounded elastic tumor. These circumstances left little doubt that the maxillary sinus was occupied by a tumor which was gradually forcing itself out from the bony cavity in which it had originated. I advised, therefore, an immediate operation.

The operative procedure was as usual, and occupied about ten minutes. The hemorrhage was not excessive, and the vessels were easily secured. The edges of the wound were at once approximated by sutures; and a bit of lint, moistened with cold water, laid over the surface.

No lint, bits of sponge, or other substances, as recommended by some of the French surgeons, for filling up the cavity made by the removal of the jaw, were used in this, or the other cases in which I have done the operation. Whenever I have seen them used, they have been the source of much irritation, have been with difficulty removed, and have caused a most offensive odor, from the retention of foul secretions in the mouth.

She recovered fully and entirely; and now, at the end of nearly nine years, I have heard of her in the enjoyment of good health. The eye suffered no injury from the operation.

The tumor was of a fibrous character, and was completely bounded by its capsule. In its expansion, it had at first nearly obliterated the lachrymal passage; next, it had produced an absorption of the bone, in the vicinity of the nostril, forcing its way through into that cavity; and, finally, it was making its way downwards through the bone into the back part of the mouth.

The operation was as effectual and satisfactory in its result as any one of this description that I have ever done or witnessed.

APPARENT TUMORS OF THE LOWER JAW, SECONDARY TO THE REMOVAL OF CANCER OF THE LIP. — It is sometimes necessary to remove a part of the jaw for other diseases than tumors of the bone. Tumors which take their origin in the vicinity of the bone sometimes grow around and envelop it so as to necessitate its removal.

After having examined a firm and apparently osseous tumor of the lower jaw, and after having fully decided on an operation for its removal, I have often been surprised to learn that the patient had, a year or two before, been operated on for cancer of the lip. On critically questioning him, I have discovered that the tumor had originated, not in the jaw itself but under it, in the position of the submaxillary gland, and increased, until finally, embracing the bone and becoming adherent, it could not be distinguished from the bone itself.

CASE LI. — *Tumor simulating Cancerous Disease of the Parotid, accompanied with Paralysis.* — I have been lately consulted by a gentleman who had a hard tumor growing just behind his ear, of a year's standing. It extended under the jaw; was very firm, almost like bone; and appeared to be the parotid in a state of malignant disease. The side of his face was paralyzed; and also, curious to relate, there was a slight paralysis of the left arm, the tumor being on the right side of the body. I found, on investigation, that a few months before the commencement of the present tumor, a cancer of the lip, of some years' duration, had been removed from the left side.

CASE LII. — *Tumor, involving the Jaw, occurring after Removal of Cancer of the Lip.* — A gentleman 68 years of age was politely referred to me for advice, by Dr. Gilman, of Portland, for a tumor about as large as a small orange, growing from the lower and outer edge of the jaw, on the left side, concealing the angle, and extending backwards so as to press

upon the great vessels of the neck, and partially to interfere with the trachea. The inner aspect of the jaw was quite normal, and the teeth were evidently not involved. It felt like an exostosis, and had the regular form characteristic of a cystic tumor of the bone: it was, however, perfectly firm, and had none of the elasticity of the latter kind of growth. I had settled, in my own mind, that it was of a bony nature, when the patient told me that it had begun, about a year before, as a small, movable tumor in the situation of the submaxillary gland; and that it had not become fixed until after eight months, and had then taken on a rapid growth. He also said, that, four years before, he had submitted to a prolonged operation, by means of cancer plasters applied daily for several weeks, for a cancer of the lip, of which a scar still remained rather to the right of the median line. On ascertaining this fact, the tumor was again examined; and it was found, that, by exerting much force, a slight movement upon the jaw could be produced. The patient was therefore informed, in as delicate a manner as possible, of the nature of the disease, and that an operation might be performed for the removal of the tumor, either alone, or with a portion of the jaw, which would be a much less difficult and bloody affair: the danger of recurrence would of course remain. He wisely concluded, however, on account of his age and his entire immunity from pain, as well as from the danger of recurrence, not to have it interfered with.

CASE LIII. — An old gentleman, 75 years of age, was brought to the Massachusetts General Hospital, with a tumor of the right side of the horizontal part of the lower jaw, of about the size of a pigeon's egg. It was firmly attached, and seemed to form a part of the bone, and so far painful as to induce him to request its removal. It had commenced at the lower and inner edge. Upon inquiry, I found that he had been operated on for cancer of the lip a few months before the growth had appeared. I informed him of the probable nature of the disease, and of the danger of recurrence after removal. He decided to have an operation performed. Accordingly, the portion of jaw involved in the tumor was removed. The

disease, on examination, was found to be cancerous, and firmly embraced the bone, although by careful dissection it could be entirely separated from it, including, however, the periosteum. The termination of this case was interesting. After the patient had recovered from the ether, he got up and insisted on walking downstairs, which he did with the aid of two persons, one on each side of him. Just as he arrived at his bedside, he became suddenly faint. The attendants came running upstairs, and informed me that the patient was in a dying state; and, on going instantly to him, I found that respiration had ceased, and that the pulsations of the heart were scarcely perceptible. The mouth was immediately opened, and the finger passed down the throat, in order to allow the entrance of air into the larynx: it was then found that the tongue had become retroverted from the partial detachment of some of its muscles, and had retracted down the throat. It was at once seized with forceps, and drawn out of the mouth, and means taken to produce artificial respiration, as in cases of drowning; and eventually respiration and the circulation were restored. The patient did well for a time; but, at the end of about a week, he was seized with thoracic symptoms of which he died.

NECROSIS OF THE JAW. — Necrosis of the jaw-bone is sometimes caused by arsenious acid, used to destroy the nerve of a tooth; at others, by phosphorus; also by the depressing effects of cold; and now and then we see it occur without any specific cause.

The use of arsenic, introduced into the cavity of a carious tooth, has been very extensively followed, for the purpose of producing a slough of the pulp, and thus admitting of the subsequent preservation of the tooth by filling. Unless carefully protected by mixture with morphia, to dull sensibility, the pain is often of the most excruciating character; but, with the benumbing effect of this agent, the escharotic action goes on, in many cases, unheeded. In one or two instances in which this agent has been used, and allowed to remain for too great a length of time, or else from some peculiarity of constitution, principally in persons of scrofulous diathesis

and of low vitality, I have seen very severe effects produced; the cauterizing action not only destroying the vitality of the tooth, but going farther, possibly by absorption, and producing extensive necrosis of the alveolar processes, almost as great in the upper jaw as we see in the lower from the effects of phosphorus. In one case, a delicate young lady, whom I saw in consultation with Dr. N. C. Keep, of Boston, to whom she had applied for advice, had suffered extensive destruction of the alveolar processes of one side of the upper jaw, caused, as was supposed, by arsenic applied by a dentist and left too long in the cavity. The following case I saw in consultation with Dr. E. T. Wilson, Jan. 3, 1865.

CASE LIV. — *Necrosis of Upper Jaw arising from the Use of Arsenious Acid.*—A young married lady, of scrofulous habit, had arsenic introduced into the right bicuspid tooth of the upper jaw, where it was left over night, causing great suffering. The tooth had been afterwards filled, but was always the source of more or less uneasiness. About three years after, she had a long and debilitating illness, at the end of which she found that this tooth, together with one or two of its neighbors, was quite loose, — so loose, in fact, that she removed them with her fingers. On applying to Dr. Wilson, he found that the alveolar processes were in a state of necrosis, and requested my advice with regard to an operation. The gums had receded quite extensively, leaving a large piece of jaw dead, and in a most offensive condition. On seizing the bone, I found it so firmly fixed that I advised against any immediate operation. Dr. W. agreed to give her a detergent wash of tannin and creosote, and to await the farther loosening of the bone. I afterwards learned that it separated piecemeal.

Dr. Wilson informs me, that, whenever he uses the arsenic, he always applies it in the morning, so as to watch its action, and removes it before night; most of the accidents having been caused by applying it one day, and allowing it to remain until the next before removal.

In another case, a young lady had a bicuspid tooth filled by a dentist, the nerve having been first destroyed by arsenic left

in over night. Six months after, her face swelled, and an abscess formed at the root of the tooth which was extracted, the alveolar process coming out with it in a state of necrosis. Afterwards other pieces of bone came away from the jaw in the vicinity.

Her face looked puffy; and she had constitutional symptoms, such as swelling of the abdomen, and great loss of strength. Many of the teeth in the upper jaw became so loose that they might have been extracted with the fingers. She was a very handsome person, of fine physical development, and had a beautiful set of teeth; and, before the use of the arsenic, had always had good health.

I have seen other similar cases; but those given above will serve to illustrate the affection.

CASE LV. — *Necrosis of half of Lower Jaw from Phosphorus.* — A young woman, 19 years old, entered the Hospital on the 29th February, 1860, for necrosis of the jaw of five months' standing. She had been an operative in a match factory for two years, and her employment was to pack the matches in paper. Five months before, an abscess formed under the posterior part of the jaw, behind the angle; and, from this spot, there was a discharge of offensive pus. Denuded bone was detected in this situation. On the 7th of March, she was etherized; and a bit of bone an inch long, and two smaller pieces, were removed. On the 25th of April, she was again etherized, and the cheek laid freely open, exposing most of the jaw, which was found completely dead but firm. On the 30th of May, a final operation was performed. The bone was firmly seized by a powerful pair of forceps, worked gently, for some time, to and fro; and, finally, a portion of the body and the whole of the ramus were removed. On the 17th of June, the wound was closing rapidly; and new bone was found to be forming in the place of that which had been lost, the processes being well marked. This patient remained some time afterwards in the Hospital, acting as nurse. The wound gradually healed, and she was left with quite a well-formed jaw, serviceable for all purposes. I subsequently saw her, some years afterwards, in the full enjoyment of health.

CASE LVI. — *Necrosis of the Lower Jaw, from the Effects of Cold.* — A young lady 25 years of age, in moderately good health, about the middle of September, 1859, walked over South-Boston Bridge with her face exposed to a very high wind. Almost immediately, she began to feel an uneasiness in the right side of the lower jaw. This increased, accompanied with swelling of the gum. After some weeks, the second molar tooth was removed, being completely loosened and detached from its socket. The disease extended forward. At the same time, the left knee began to swell, and a copious effusion of serum took place into the joint.

At the time of my visit, I found her confined to the sofa by the trouble in the knee, and in a very nervous and highly apprehensive condition. On examination of the jaw, the canine tooth and those behind it, with the exception of the last molar, were loose. Passing a probe into one of the numerous openings which existed in front, the alveolar portion of the jaw was found denuded; and the probe, at one point, passed quite through it. A slight swelling appeared below the jaw.

As she was suffering no pain, and the bone was still quite firm, I did not advise any immediate operation. She was recommended to take wine, and as much nourishment as the stomach could well bear, consistently with her confinement, and to have an attempt made to remove the dead bone as soon as it seemed loosened from its attachments.

This was afterwards done by her physician, and she completely recovered.

CASE LVII. — *Necrosis of Lower Jaw, from Exposure to Cold, while under great Mental Depression.* — A man 49 years of age entered the Hospital, March 10, 1866, with a necrosis of the right side of lower jaw, extending from beyond the symphysis to the angle.

Inflammation and swelling had commenced in the jaw, after exposure at a funeral, while suffering from want of food, and under great mental depression. Most of the teeth had dropped out, there was a very offensive discharge, and his health was much affected.

I removed the whole of the jaw in a necrosed state, leaving the periosteum at the sides, and a thin rim of new-formed bone on the lower edge.

The incisor teeth remained loose in the gums, their roots projecting into the cavity left by the removed bone.

I saw this man on the last of May, entirely recovered. New bone was deposited in the place of the old, which he could use in the mastication of moderately hard substances. The incisor teeth had become pretty firmly fixed in their places.

THE TONGUE.

CASE LVIII. — *Encysted Tumor under the Tongue, resembling Ranula.* — The tumor under the tongue called *ranula*, whether it be a dilatation of the salivary duct or a distinct tumor, is always troublesome in treatment. I tried, for a number of years, Dupuytren's method of a permanent button, which, though effectual, has the disadvantage of requiring to be permanent. Perhaps excision of a portion of the sac, and the free application of the tincture of iodine to the interior, if this be found necessary, is as good as any practice. The following case of tumor under the tongue is interesting, as resembling this disease, which I have frequently seen of great size, and forming a tumor on the side of the neck. It was, however, in this case, placed in the median line, and, as soon as the operation was commenced, was found to be a different affection.

When I first saw this patient, on opening his mouth, it seemed to be entirely filled with a greatly enlarged tongue. On farther inspection, the tongue was found crowded into the back part of the fauces. An elastic tumor occupied the mouth, and extended beneath the jaw, appearing in the neck. The patient was 25 years of age, a painter by trade; and the tumor had been of seven years' growth.

This large sac was completely dissected out, with slight hemorrhage. Its contents were acid, white colored, and of the consistence of cream. An inflammatory action followed, producing hoarseness and difficult deglutition: this lasted a week or ten days, and he was entirely well at the end of a fortnight.

CASE LIX. — *Cancer of Tongue. Removal. Recurrence. Death.* — A gentleman, 30 years of age, called on me about the year 1850, on account of a white film under the back part of his tongue, on the right side. It had the appearance of mucous membrane which had been touched by nitrate of silver, and turned white; but the edges were more perfectly defined. He was nervous about it and wished its removal, fearing that it might become cancerous. I dissected it carefully off from the tongue; and he had no trouble for a number of years. In 1855, on my return from abroad, I found a small ulcer at the spot from which the disease had been removed. He did not send for me till about six months afterwards, when the tongue was solidly fixed, and pervaded by a cancerous infiltration. He was in a most deplorable condition: the saliva was constantly running out of his mouth, deglutition was difficult, and the pain at times very severe. The disease gradually extended down his throat, and finally opened a large-sized vessel, when a profuse hemorrhage occurred, which was checked by a gargle of a strong solution of perchloride of iron. He was gradually exhausted by loss of blood, and finally died in an anæmic condition.

This case is curious from the manner in which it commenced, without ulceration and as a simple white deposit. I have lately seen another case with white deposit on one side of the mouth, and extensive cancer of the gums on the other, brought on by excessive use of tobacco. In regard to operations for cancer of the tongue, I can simply say, they are generally unsuccessful. As to the method of operating, I formerly used ligatures, rarely the knife; but of late years the *écraseur*.

CASE LX. — *Solid Encysted Tumor of the Tongue. Removal.* — Oct. 12, 1847, a physician of Worcester brought to my house a patient with a tumor on the end of his tongue. It was about as large as a filbert: on the tip was an ulcer the size of a pea. The tumor was first noticed seven weeks before, and the ulceration two weeks. There was no pain nor tenderness.

Passing a pointed knife behind the tumor, I made an incision around the left side, when the pressure of the knife caused the

escape, through the ulcerated aperture, of a solid red substance, like a small cherry. The operation was completed by an incision on the right side, by which a cyst was removed, with a small portion of the tongue.

The cyst resembled those so frequently met with in the substance of this organ. The solid tumor appeared to be organized, and not malignant; yet its connection with the enclosing cyst must have been very slight, as a moderate pressure expelled it.

A stitch was employed, and the patient went home the same day. He had been in the habit of chewing tobacco.

In another instance of a solid tumor situated in the centre of the tongue, a simple incision was made over the top of it, when a small, hard, fibrous tumor was shot out, having, apparently, scarcely any connection with its envelopes.

I have also seen a tumor, in this situation, apparently of a fatty nature.

SALIVARY CALCULUS.

CASE LXI. — *Interesting Case of Salivary Calculus.* — An English gentleman, 40 years of age, applied to me, in August, 1859, on account of a very painful enlargement and inflammation of the left submaxillary gland, attended with an abscess behind it, which discharged through the duct under the tongue; a small quantity of pus also escaping through the gland and integument. The inflammation of the gland came on two years before, after exposure to cold. Subsequently, and after much suffering, two small calculi were extracted from the duct in the mouth. This gave temporary relief. The pain however, in the gland and whole of the neck, continued, sometimes of the most agonizing description; affecting the system, and keeping him from his employment. Applications of iodine and other remedies had afforded no relief.

It was with great difficulty, that the aperture in the mouth, through which the pus was discharged, could be brought into view, as it lay far back, and was obscured by the tongue; but by placing him in a strong light, holding the tongue to one side, and requesting him to press the gland up, pus was seen to

issue from it. A probe was insinuated into this opening ; but it was not of sufficient size to serve as a guide to the knife. An incision downwards was therefore made close to the jaw, until the pus flowed freely. This opening shortly closed up, and the operation required to be repeated. In the mean time, it was impossible to make the slightest examination of the gland externally, the touch of the probe gave such exquisite pain.

Under the influence of ether, a semilunar incision was made over its surface, exposing the indurated and highly inflamed gland. The blood gushed out at once from the whole surface, obscuring it, and requiring some delay in the dissection. A small aperture was found at some distance from the opening in the skin, which would admit a fine probe into an almost callous canal beneath the gland. With much care and great difficulty the size of the probes was gradually increased, until a director could be introduced. This being a little curved, and turned in an upward direction, encountered a resistance which at first appeared to be bone, but was finally ascertained to be a calculus. A finger was introduced into the throat and under the tongue, and pressure made on the outside ; but no hard substance could anywhere be distinguished. The only means left, therefore, seemed to be by penetrating to it through the hard deposit. By careful touches of the knife, and dilatation with the scissors, an aperture was finally made large enough to admit of the introduction of a small pair of polypus-forceps, by which the stone was broken up, and withdrawn piecemeal. The enlargement of the aperture by the scissors, by introducing them shut and withdrawing them partly open, was followed by a gush of blood, which continued to flow for some time, as if from the wound of a large vessel ; and, it being impossible to reach the deep origin of the bleeding, a bit of sponge was crowded down into the cavity, as soon as the calculus was removed, and arrested the flow of blood. This being removed, after a few minutes the bleeding recurred, but suddenly stopped. As a matter of precaution, and in order to keep the wound open to permit a free discharge, the sponge was replaced.

From this time he gradually recovered ; and now, at the end of seven years, remains well.

CHAPTER III.

THE NECK.

FOREIGN BODIES IN THE AIR-PASSAGES.

DR. GROSS, the distinguished Professor of Surgery in the University of Pennsylvania, and surgeon at the Pennsylvania Hospital, has done more than any other person, in his work with the above title, to illustrate this subject, as he has all other subjects in surgery.

It is well known, that operations on the trachea are always of a startling character, and require great skill and prompt action on the part of a surgeon, to save life ; whether it be for the removal of a foreign body, for croup, or for the other inflammatory affections of this organ.

In the latter instances, the surgeon is often called upon, without any previous preparation, possibly in the middle of the night, without assistance, and with a bad light, to perform one of the most critical operations in surgery ; the patient gasping for breath, and dependent on the exertion of the utmost skill for life.

From the great difficulty in respiration, the neck is generally crowded with venous blood, the free flow of which obscures the incisions ; and, on the trachea being opened, it is apt to rush into the air-passages, and suffocate the patient. If the surgeon hesitates, on the other hand, and waits to secure the vessels, death may occur before the trachea is reached. Fortunately, in most instances, as soon as the air enters freely into the lungs, the congestion in the veins is relieved, and the bleeding ceases.

The diagnosis of the existence of a foreign body in the trachea or in the bronchus, although at first it would seem not to be

attended with much difficulty, is often very obscure. This is particularly the case in young infants, and in children of four or five years of age. On its first introduction, there is usually great choking, and violent irritation of the air-passages. After a time, however, if the substance sink down into the lungs, these symptoms disappear; and it is then necessary to look for another class of phenomena upon which to base an opinion. These consist, in the first place, of dulness on percussion of the affected side; second, of more or less diminution of the respiratory murmur, according as a larger or smaller bronchial tube is obstructed; third, of more or less bronchial and subcrepitant râles; but these may be observed equally on the sound side of the chest, being provoked by the general irritation of these organs. The diagnosis becomes more difficult where the patient has had a previous bronchial disturbance, or has been exposed to the whooping-cough or measles, all of which complications I have had occasion to witness. The importance of a correct diagnosis is very great; for, if an operation be deferred, the substance may suddenly be started from its hiding-place, and driven up into the glottis, causing death before any help can be obtained.

The following pages contain the substance of remarks on this subject, in a condensed form, published in the "Boston Medical and Surgical Journal" for 1847, and referred to in Dr. Gross's valuable work, with additional cases:—

CASE LXII. — *Bean in the Left Bronchus.*—On Tuesday evening, Oct. 13, 1847, I was called to see a little girl, eight years old. The same morning, while laughing, a common garden bean was drawn into the trachea. At first she was nearly suffocated. Gradually the cough and struggles became less violent; and during a ride of four or five miles almost entire tranquillity in the respiration was restored. After an hour or two the difficulty of breathing returned, and finally became so laborious that the parents, being alarmed, determined to bring her immediately to Boston.

I saw her at 7 o'clock, P.M. The countenance was pale, rather livid, and expressed great anxiety. On any change of

position, a cough was produced, attended with the ejection of a quantity of mucus. On auscultation of the back of the chest, the sound of the natural respiration was much obscured by a loud mucous râle: in front, the râle was very loud on the right side; but, on the left, the sounds of respiration and the râles were, in a great measure, wanting. On percussion, the left side was a little flatter than the right. There was no sound, either in the lungs or trachea, to indicate the movement of a foreign body. The voice was husky, as in croup.

In view of the above symptoms, I had no doubt that the foreign body was lodged in the left bronchus, and advised the following course: First, in order to ascertain if the substance was movable, and likely to ascend towards the larynx, that the child should be suspended with the head downwards, the throat irritated, and percussion made on the chest. Second, if the substance could be made to fall into the trachea by these means, to perform the operation of tracheotomy.

The first proposal was carried into effect. The child was taken by the legs, and held with the head downwards; then, passing my finger into the throat, I carried it quite below and behind the epiglottis, so as to induce strong efforts to vomit. Percussion of the chest was also practised.

The process above described was twice repeated without avail. A great quantity of mucus was brought up by coughing; but no strangulation was induced, nor other symptom to indicate a change of position in the foreign body. Quiet was now enjoined, and an opiate in case of great irritation.

The following night was passed quietly, and only disturbed by one fit of coughing. These attacks were produced by the slightest mental or physical excitement. The râles were slightly increased.

In consultation, it was concluded as follows:—

1st, That the great want of success attending the operation of opening the air-passages, and searching for foreign bodies, arising from the irritability of the parts, and the consequent difficulty of manœuvring instruments, did not render an immediate operation desirable, particularly as the patient was comparatively easy, and the danger not pressing.

2d, That the spontaneous expulsion of these bodies was not unusual.

3d, If symptoms of strangulation came on, to operate immediately.

It was determined to give the child an emetic of ipecac., as considerable febrile action was present, and the effort of vomiting might possibly move the foreign body. This was done with much relief to the breathing, but without causing any change in the situation of the substance.

On the morning of the 15th, I found her quite as comfortable as on the day previous.

About 4 o'clock in the afternoon, I was called in haste. In a paroxysm of mental excitement, produced by the mother's taking leave of her, the bean was suddenly disengaged, and brought on strangulation. When I arrived, she was almost exhausted; the face was livid, and she was writhing in distress, like a person having a cord tied tightly around the neck.

I immediately proceeded to open the trachea. The skin and superficial fascia being divided, and the thyroid plexus of veins avoided or tied, as I was separating the sterno-hyoid and sterno-thyroid muscles, a sudden crack was heard, as if some portion of the lung had given way. This was immediately followed by an emphysema of the cellular membrane in the neighborhood of the wound; and a small tumor, filled with air, was forced up out of the chest, on the left side and in front of the trachea, at each movement of inspiration. A mitigation of the distress in breathing followed this occurrence. The tumor was now held back with a spatula, and a sharp-pointed bistoury plunged into the trachea. The bean was seen greatly swollen, moving up and down in the tracheal passage, and completely filling its calibre. The edges of the trachea being separated, the bean was seized with some difficulty, on account of its softness, and withdrawn. She immediately, on the conclusion of the operation, fell into a most profound sleep.

The bean had swollen to more than double its original size. On measurement, it was ascertained to be two-thirds of an inch in length and half an inch in breadth.

The patient recovered without any bad consequences.

Remarks. — The rupture in the air-passages did not present any subsequent symptoms which could be referred to these organs, and therefore there must be some hesitation in deciding upon the seat of this accident. In all probability, it took place at the root of the lung in one of the larger bronchial tubes, and the air made its way out of the chest without implicating the pleural cavity. A similar rupture I once before observed in croup, — the neck and whole side of the chest becoming emphysematous, with an immediate relief to the breathing, as in the present case.

Subsequently, having procured some garden beans of a similar kind to the one removed, I immersed them in water of the temperature of the body and found that in forty-eight hours they were increased in bulk to more than double, and some to treble, the natural size. This shows that when substances which may become enlarged by the heat and moisture of the body are introduced into the air-passages, no hope can be entertained of their spontaneous expulsion. In such cases, operation should not be delayed.

I saw this patient fifteen years afterwards, grown to a large, fine-looking woman. She had never experienced any inconvenience from the effects of the accident or the operation.

CASE LXIII. — *Horse-shoe Nail in the Bronchus. Spontaneous Expulsion.* — On May 10, 1846, a little boy, between two and three years old, was brought to me with a nail in its lungs. The account given was as follows : —

Three weeks before, the child came into the house from a blacksmith's shop in the neighborhood, from which he had lately been forbidden by his mother. In order to punish him for his disobedience, she took him in her arms, and set him down in a chair with some violence. He was immediately seized with choking and with a violent cough. As soon as he could answer, he said that it was caused by a nail in his mouth.

The cough for a time subsided, but shortly returned with some attendant inflammatory symptoms of the lungs, which lasted a week. At the end of that period, as the child was lying over a chair, with its head hanging downwards, a sudden clucking

noise was heard, as if a substance had been thrown up into the windpipe, and was at once followed by a paroxysm of suffocation which nearly destroyed him. He was placed in a sitting posture, and the obstruction was shortly removed.

He had twice had similar attacks, always coming on when the head was in a dependent position. In the intervals, he had a hoarse cough, and also had night-sweats, loss of appetite, and emaciation.

In this state I saw him. He was rapidly failing from the irritation of the lungs.

The signs, on auscultation, were as follows: The whole chest was flatter than natural on percussion. On both sides a loud mucus râle was heard, rather more marked on the left than on the right side, but not sufficient to determine with precision in what part of the lungs the substance was imbedded.

In the course of six days, he had four attacks of suffocation from the dislodgement of the foreign body, which rose into the trachea. The last attack came on while he was at dinner, and so suddenly that he fell back as if he had been shot, and was with great difficulty recovered.

Being now fully satisfied of the presence of a foreign substance in the air-passages, I determined to perform the operation of tracheotomy, and directed his father to be sent for. This was on Friday; and the time appointed for the operation was the ensuing Monday, as the earliest date at which the father could reach the city.

The following course had been marked out:—

The child being firmly bound to a board, to make an opening into the trachea, just above the sternum, with the hope that, in consequence of the irritation thus produced, the foreign substance would be forced up, and present itself at the orifice of the wound. If this did not happen, to invert the body, which, in all probability, would cause its dislodgement, and thus it might pass through the epiglottis, the violence of the spasm of that organ having subsided; or, at any rate, it might be extracted through the wound.

The preparations having been made, on the day appointed for the operation, ten drops of laudanum were given in divided

doses, in order to produce as much quiet as possible during the dissection of the neck and opening of the windpipe. Previous to its performance, I proceeded to make a last examination of the chest, and, much to my surprise, found that the mucous râle had almost entirely disappeared. His mother said, also, that the cough had been much less for the last two days, and there had been no recurrence of suffocation since the violent attack of Friday. Under these circumstances, it was decided to invert the body before opening the windpipe. This was most thoroughly tried, and the fauces repeatedly irritated by passing a quill down the throat, but without effect. The operation, of course, was not persisted in; and, in fact, from this time he began to improve in health, and fully recovered.

I heard from him some months afterwards. He was in good health.

Remarks. — The apparent mystery connected with this case seems to be explained in the following manner: —

To questions as to circumstances attendant on the last paroxysm of suffocation, the mother said, that, while he lay on the floor, as she thought dead, she seized with her fingers the tough and stringy mucus protruding from his mouth, and, when pulling on it, it seemed to unwind from a body in the throat; — that on Saturday and Sunday, the two following days, the child suffered from severe pains in the bowels, which were relieved at night by a powerful fecal discharge, forty-eight hours after the attack of suffocation. It is highly probable, therefore, that the nail, rolled up in the tough, adhesive mucus, was thrown up into the larynx, completely obstructing its passage; and that the mother, by pulling on the mucus, partially detached it from the nail, and finally dragged the latter into the throat, whence it was swallowed, and ultimately discharged in the evacuations.

CASE LXIV. — *A Bit of Birch Bark in Left Bronchus. Girl, aged Eight Years. Laryngotomy on the Sixteenth Day. Vain Attempts at Extraction. Death at the End of a Month and a Half after the Accident. Inflammation of the Left Lung and Pleura.* — Nov. 26, 1850, a girl eight

years old, while chewing a bit of birch bark, let it slip into the windpipe. The accident was instantly followed by a paroxysm of coughing and suffocation, which continued to recur at intervals for nearly a week. A sudden change in the position of the substance, on the 1st of December, was succeeded by a return of such violent coughing and strangulation as to excite fears in regard to the immediate result. At the end of the paroxysm, the bark settled down into one of the bronchial tubes, with a mitigation of the severe symptoms. I saw the child Dec. 9th, when the breathing was much oppressed, and she had a constant dry cough. She looked haggard, and the countenance had a livid hue; the skin was hot and dry; the pulse one hundred, and the appetite lost. The left side of the chest was duller, on percussion, than the right; and scarcely a respiratory murmur could be detected in the posterior part of the corresponding lung: there were mucous râles on a level with the bifurcation of the trachea. In front, especially above, the breathing was still performed, though very feebly. On the right side, the respiration was puerile. All these circumstances denoted that the substance was lodged in the left bronchial tube.

The following night, she had another paroxysm of coughing, during which the bark was again dislodged, and passed up into the larynx. The attack was attended with slight epistaxis.

Laryngotomy was performed Dec. 12th, the patient being fully etherized. A pair of forceps, six inches in length, and so constructed as to open only an inch at the end, was then carried down into the left bronchial tube, but without grasping the offending substance. The operation was thrice repeated; the instrument being retained each time about one minute, without, apparently, the slightest inconvenience. She was next suspended by the heels, and the throat irritated to provoke free vomiting, but without avail. Finally, the abdomen was compressed, and the air in the lungs suddenly and violently expelled by the hands applied to the chest. The child, considerably exhausted, was put to bed, and the opening protected by a bit of gauze. She had a quiet night, with less cough; and the wound manifested a disposition to close.

After several weeks, she was taken home. The congestion of

the lungs increased; and she expired Jan. 9, 1851, nearly a month after the operation, and nearly a month and a half after the accident.

The right lung was in a healthy state. The left lung was dark-colored, pitted on pressure, was firmly attached to the diaphragm, and excessively loaded with blood and serum. The bronchial tubes were filled with muco-purulent matter, and those on the left side were in a state of high inflammation. The offending body, three-quarters of an inch long and one quarter of an inch wide, with the appearance of being much swollen, was found lying loose in the trachea. It had evidently been accidentally pushed up, during the examination, from the left bronchial tube, where there were marks of its having been impacted.

CASE LXV. — *Bit of Nut in Left Bronchus. Girl, aged Four Years. Laryngotomy. Ejection of the Skin and Kernel of a Nut, followed by a small Bit of the Shell at the end of a few weeks. Recovery.*—In April, 1851, I was called to see, in consultation, a child who, four days before, had inhaled a bit of nut. She was seized with violent coughing, paroxysms of which had continued to recur at intervals. At the time of my visit, her countenance was livid, breathing difficult, and her strength much impaired. Auscultation revealed a great diminution of the respiratory murmur in the left lung, with some râles; while, on the right side, it was distinctly puerile.

As the symptoms were urgent, the crico-thyroid membrane was immediately divided, while the child was under the influence of ether. A bougie, slightly bent, being passed into the left bronchial tube, the substance was readily dislodged, and the skin and kernel of a nut were expelled at the artificial opening. After further search, under the supposition that part of the offending body might still remain, the operation was concluded, and the child put to bed.

On the following day, the patient was doing well, and appeared greatly relieved. The wound healed rapidly, and she was soon able to go about. Some cough, however, remained, accompanied with a mucous râle in the left lung.

At the end of a few weeks, the child suddenly brought up, in a paroxysm of coughing, a small bit of nut-shell. All the symptoms now disappeared, and she rapidly regained her health.

CASE LXVI. — *Pin in Larynx. Ejection into Throat during Operation. Death, thirty-six hours afterwards, from Exhaustion.* — I was requested by Dr. Patch, about the middle of the day, to see a child, who, he said, was in a state of suffocation from a pin in the windpipe; and whom, it was possible, we should not find alive. He had been called to it in the morning, at nine o'clock, when the accident had first occurred; but, the substance having settled down into the lungs, and relief being obtained, and the doubt existing as usual in regard to the facts of the case, he left it for further observation. The symptoms having recurred, I was called in. The child was then quite black in the face, partially insensible, and the foreign body flying up and down in the trachea.

Tracheotomy was at once performed, the dissection being much embarrassed from the distension of the fat and short neck with venous blood. As soon as the trachea was opened, the spasm of the larynx subsided, and the foreign body seemed to disappear. An instrument was passed up into the mouth, and down to the bifurcation of the trachea; but no trace of it could be detected. When the blood had passed into the larynx, causing, as it always does, a severe paroxysm of coughing, the pin had evidently been driven up into the mouth, and swallowed.

The child now slowly revived from the state of asphyxia; the breathing became free and tranquil; and, during the remainder of the day, and the following day, there was no return of cough. He continued, however, pale, and without good reaction; dying on the night of the second day, apparently from the shock received by the accident, as we occasionally see in patients recovered from drowning.

CASE LXVII. — *A Grain of Corn in the Trachea. Operation. Extraction of the Substance. Recovery.* — In

the spring of 1862, a child of about five years of age was brought into the Hospital by its mother, who said that, two days before, it had got a grain of corn into the windpipe. The struggle for life was, for a time, violent. Resort was had to the usual means of relief; and respiration finally became quiet, leaving him much exhausted. Since then, he had been hoarse and stuffed, but without any return of strangulation. A subcrepitant râle was heard over the whole surface of the lungs, on both sides; but rather greater over the left than the right lung. There was also greater absence of respiratory sound on the left side.

On account of the danger of waiting, it was determined to try the following experiment:—

The child, being etherized, was suspended with the head downwards, as in a former case, and sharply struck on the back, the fauces being at the same time irritated; but these efforts were without effect in dislodging the foreign substance. The child was therefore retained in the house, and narrowly watched.

On the next day, the respiration was easier; and he appeared generally in a better condition, although it was very difficult to make an investigation, on account of his excessive timidity, which, in children, is often a most serious obstacle to diagnosis. On the next day, the house-pupil reported that the night had been quiet; but, on visiting him later, the mother informed me that he had since had an almost fatal attack of suffocation. In the course of this attack, the child had brought up a good deal of thick mucus, which she had dragged out from its mouth with her fingers. I decided at once to operate.

The child was etherized, and the trachea opened. On the entrance of air and blood, the usual convulsive action resulted, followed by the appearance of the kernel of corn at the aperture, and its almost immediate expulsion. All the symptoms were at once relieved; and the child went home well, ten days after the operation.

If the operation had been delayed, the result would, in all probability, have been fatal.

Conclusions.—The following conclusions may be deduced from a review of these and similar recorded cases:—

In the first place, it is unsafe to trust to the chance of spontaneous expulsion any substance which is liable to have an increase of bulk from the heat and moisture of the human body; as, in all probability, the swelling will render its exit impossible.

2d, Metallic substances, or those not embraced under the preceding head, when engaged in the larynx or lodged in the lungs, may be trusted with more impunity. If flat, they naturally present an edge to the tube, so as to permit the passage of air on either side. When lodged in the bronchus, such a substance becomes, after a time, enveloped in mucus, so as to obstruct the free act of respiration: it is then forced upwards, and, in the struggle which ensues, the mucus is disengaged. The body then falls back, and remains quiescent until it again becomes covered with mucus, when the process of dislodgement is repeated. Sometimes, in the violent cough which occurs at the change of place, it is forced out into the mouth, and swallowed or ejected; at others, by coming up suddenly, when the patient's attention is distracted, it takes the larynx by surprise, as it were, and easily escapes.

An interesting case of this latter class occurred in a little girl, a patient of Dr. Hale, on whom tracheotomy was performed, by Dr. J. C. Warren, for the removal of the wooden stopper of an inkstand, which had been sucked into the trachea. As soon as this passage was opened, all irritation subsided; the foreign substance settled down into the bronchus; and although the wound was kept open a week, and attempts made to dislodge it, they were without avail. Some months afterwards, as the patient was looking out of a window, very intently watching the passing of a military company, the stopper came up, without effort, into the mouth, and was at once expelled.

3d, If the substance is fixed in the bronchus, and the patient young, the prospect of seizing it by instruments introduced through the wound, and carried down in the direction of the lungs, is extremely small. In fact, I do not know of a single successful case upon record, with the exception of one in which Mr. Liston opened the trachea of an adult, and, introducing the forceps with some difficulty, seized a bone, which had become engaged in the right bronchus.

4th, Some doubts will arise, however, as to the propriety of leaving, in any case, a foreign substance, for a period of time, in the lungs, without an effort to remove it. For although it may finally become detached and be ejected, as it frequently is, after remaining many months or years imbedded in the lungs, or stowed away in the bronchial tubes, yet fatal organic lesions are not uncommonly the result. The surgeon must therefore be guided by the particular circumstances of each case.

It is remarkable in how great a number of these cases, which we find recorded as having occurred in children, the substance introduced was a common garden bean.

CROUP.

Tracheotomy is also required in many cases of croup. About twenty years ago, I operated several times in such cases. Immediate relief from suffocation was obtained, and, for a few days, the result seemed almost miraculous; but the lungs had become affected, and the powers of life so weakened that the final result was fatal. An earlier performance of the operation was necessary; but, at that time, the public, and even the profession, were not convinced that there was little or no danger attending it. I have never seen a case where death could be ascribed to it. Tracheotomy in croup was revived in Boston by Dr. George H. Gay; and the practice has been followed successfully by Drs. Samuel Cabot, Henry G. Clark, and many other surgeons in Boston and elsewhere.

After the operation, the air of the room should be kept warm and moist. A double tube should be used, and competent persons employed to watch the patient, and remove the inner tube in case of obstruction. I have no doubt that many lives have been lost for want of this precaution. The tube suddenly becoming obstructed by thick, adhesive mucus, the patient is seized with violent symptoms, and the alarmed parents send for medical aid; but the physician arrives only in time to see the case terminate. Many of the deaths which formerly took place after the earlier operations for croup undoubtedly arose from the want of the inner tube.

The following cases are illustrative of tracheotomy, as required in some other affections : —

CASE LXVIII. — *Laryngitis. Tracheotomy.* — A woman about 30 years of age came into the Hospital, in April, 1859, under the care of Dr. J. B. S. Jackson. She had been suffering for some days apparently with a severe cold on the lungs, and much hoarseness ; but no alarming symptoms appeared till about the time of Dr Jackson's morning visit. He had just left the bedside and crossed the ward, when the nurse called to him that the patient was suffocating. Upon stepping back, he found her with her face purple, great difficulty of breathing, entire loss of voice, pulse quick and fluctuating, the body bathed with cold sweat.

Seeing the danger imminent, he immediately sent for me, making preparations himself to do the operation in case I was not to be found. I received the message as I was entering the Hospital, and proceeded at once to its performance. When the first incisions were made, the blood rushed out of the vessels, both arteries and veins, of a color nearly as black as ink. As soon as the trachea was opened and the tube introduced, after the first violent efforts which usually accompany this proceeding had subsided, she began to breathe regularly and freely. It was five or ten minutes, however, after the free entrance of air, before the blood assumed its natural vermilion color.

She was very carefully watched ; and the internal tube removed and cleansed whenever the mucus became dry, and obstructed its canal.

She did remarkably well ; and, at the end of a week, the tube was removed. She recovered her voice, and was improving very rapidly, when she arose in the night, and walked into a cold room with bare feet, which produced a slight return of her trouble, from which she had a slow convalescence. As Dr. Jackson remarked, in this case the patient seemed to be literally snatched from the jaws of death.

CASE LXIX. — *Tracheotomy. A Case in which the Operation was repeated three times in an Adult.* — Dec. 17,

1864. John McK., 50 years of age, fisherman. The following is the substance of a letter, narrating the case, from Dr. H. E. Davidson, of Gloucester, Massachusetts :—

Three years ago, contracted a severe cold, accompanied by a catarrhal affection, with much obstruction of the nostrils. This was followed by necrosis of the bones of the palate, from which exfoliation afterwards took place. The following winter, hoarseness and impairment of voice came on, which continued to increase until June, when obstruction of breathing occurred, requiring the performance of tracheotomy, which was done July 22, 1863. This afforded entire relief. For three weeks after the operation, frequent applications of strong solution of nitrate of silver were made to the larynx; after which the canula was removed, as the breathing had become quite free through the natural passage.

On the second day of October following, the patient was seized with violent dyspnœa, threatening speedy suffocation. Tracheotomy was again performed, affording instantaneous relief.

The nitrate of silver was again used as before; and, in November, 1863, he was taken to the Massachusetts General Hospital, where he was submitted to laryngoscopic examination, but without detecting any other difficulty than inflammation of the epiglottis. The continued use of the nitrate of silver was advised, together with the internal administration of the iodide of mercury, in small doses. Jan. 1, 1864, the breathing had become so free that the tube was again removed.

In August, 1864, while engaged in fishing off the coast of Maine, the obstruction returned; rendering it necessary for him to hasten home for relief by a third operation, which was performed Aug. 10, 1864. Since that date, he has not been able to do without the tube.

This patient was a large, powerful man, and, with the exception of the present difficulty, perfectly healthy. In speaking, he generally inserted a small cork in the orifice of the canula, which enabled him to articulate in a low, hoarse voice. Any attempt at labor, however, produced great difficulty of breathing; and it was for this reason that he applied to me for advice.

The question was, why the passage of air through the larynx was not as free as it had been after former operations. The tube, he said, did not cause him the slightest uneasiness.

The man was placed in a strong sunlight, and the tube removed, when it was found that granulations had shot into the fenestrum, in the upper side of the canula, and had partially obstructed it; the aperture being, evidently, too near the outer end of the tube. The whole tube was now withdrawn, when a fit of coughing ensued, followed by the projection into the aperture of two or three polypoid bodies, which were hanging down into the trachea from the lower edge of the wound. These were successively seized, as they were forced out during paroxysms of coughing, and removed. Another tube was now introduced, having the fenestrum on its upper side, at a greater distance from the shield; so that the aperture was wholly included in the larynx. He at once breathed more freely, and spoke with a clearer voice. A few days after, this tube was replaced by another, made without the fenestrum, when he breathed equally well, the air passing on the outside of it. It seemed probable that the wound had been irritated by contact with the sharp edges of the opening in the tube, not only causing a crop of granulations to shoot into it, but producing also a thickening of the parietes of the trachea, from the polypoid growths already referred to.

The shape of the present tracheotomy tubes is generally defective, the tube being set too obliquely on the shield; the fact being forgotten, that it has to enter first nearly horizontally, and then vertically. As originally made, they were thus angular in form; the present curved figure having been adopted later, in order to admit of the introduction of the inner canula. Of the importance of this inner movable tube, it may be instanced, that, in the present case, it had to be removed three times a day, in order to clean away the dried accumulations which obstruct its canal.

Dr. H. K. Oliver, at my request, made an investigation of the state of the larynx, with the laryngoscope, with the following result: In a good light, the whole interior of the larynx could be most distinctly seen. The vocal cords were both much thickened, and partially disabled in action, the cord on one side

overlapping its fellow. The arytenoid cartilages were also distorted, and much impeded in their motions. The rima glottidis was extremely narrow.

FOREIGN BODIES IN THE ŒSOPHAGUS.

CASE LXX. — *A Cent arrested in the Œsophagus. Extraction.* — A child two and a half years old was brought to me on Feb. 16, 1859, who, four days before, had swallowed one of the large old-fashioned cents; and had not since been able to take any solid food, and, in fact, almost refused to swallow any thing. The child was firmly held in a sitting posture, its head carried back by an assistant, and a piece of wood placed between the teeth. The finger of the right hand was now carried down the throat, and an attempt made to discover the situation of the foreign body. The spasm about the throat and glottis was very great, the struggles of the child were violent, and the respiration almost stopped by the exploration. After several attempts, during which the first joint of my forefinger was severely bitten, a trace of a metallic substance was discovered, which might, however, have been one of the cartilages of the larynx. I decided to make no further attempts that day; but to resume them on the next, under the influence of ether.

On the following day, being provided with sufficient assistance, and the patient being well etherized, the forefinger of the left hand was passed down the throat, while the teeth were separated by a bit of cork; and, after one or two efforts, by pressing the larynx forward, the foreign substance could be just touched by the end of the nail. This effort it was very soon necessary to discontinue, as it impeded the respiration. A long curved polypus forceps, very flat and smooth, was now selected; the forefinger of the left hand was carried down as before; and the larynx being protected, so that the instrument should not pass into it, the forceps was introduced laterally, and, after one or two attempts, the very edge of the coin seized, and at once extracted.

The difficulty in this case arose from the depth at which

the foreign body had lodged, making it almost impossible to seize it without injury to the important neighboring parts, during the violent perturbation caused by the introduction of the finger and instrument into the vicinity of the larynx. To a person who is going to attempt this operation, I would advise a shield prepared of gutta percha, fitted over the first joint of the forefinger, to protect it from the teeth of the patient; as I have often suffered for many days after from contusions received during similar operations, notwithstanding the ordinary gags, and other means to prevent the closing of the teeth.

It is always very important, when a foreign body is lodged in the neighborhood of the larynx, that the forefinger of the left hand should serve as a guide to the instrument, to prevent it from doing injury to the very important organs in close proximity. Otherwise the epiglottis, the edge of the larynx, or the neighboring soft parts, may be seized and lacerated. When the foreign body is lodged farther down the œsophagus, this is unnecessary, as the probang or hook of Dupuytren, having once passed by the larynx, may be manœuvred low down in the œsophagus without much danger. It is, however, proper to say, that foreign bodies very seldom lodge in this location; for, if they once become disengaged from behind the box of the larynx, they generally pass easily into the stomach, and do no farther injury.

I have generally observed, that, where cents have been swallowed, they have made their appearance about the third day afterwards. In one case, one was retained about three weeks, and then passed without injury to the patient. I mention this fact, as parents are, in general, exceedingly anxious when a copper coin remains in the intestines of a child.

CASE LXXI. — *A Cent in the Œsophagus. Extraction.*
— A child five years of age was brought to me, July 25, 1849, who had been partially choked by a cent, which had lodged in the œsophagus. Attempts had been made to disengage it, which only served to force it farther down.

In order to reach it, I forced the forefinger of the left hand down the throat; and, with much effort, was able to touch it

with the end of the nail, as it lay just below the larynx. After one or two attempts, a pair of forceps, opening anteriorly and posteriorly, and curved on the flat side, were slipped over it, guided by the finger, and the cent seized and extracted.

These cases will serve to show the position of metallic substances in the œsophagus, which sometimes remain there for a long time without causing fatal consequences. I removed a quarter of a dollar from a child five or six years of age, which had remained for one or two weeks behind the larynx, without preventing the passage of solid food. Bones, for the most part, are lodged higher up, and require a different management. The finger, however, should always be used as a guide. Within a week of writing this, I removed, from the throat of a gentleman, a large fish-bone firmly wedged across the opening of the larynx.

STRICTURE OF THE ŒSOPHAGUS.

Strictures of the œsophagus require a very delicate treatment. On the one hand, if arising from traumatic causes, and of a fibrous character, they are susceptible of great relief; and the patient suffering from starvation may be restored to a state of almost perfect health by a persevering and judicious application of dilating instruments. On the other hand, if the affection is malignant, the use of instruments is sometimes extremely pernicious.

There is reason to believe, that a stricture of a non-malignant character, after a duration of many years, may, from the deterioration of health, or from other reasons, take on a malignant course. It is difficult to decide whether the affection is cancerous. The complexion of patients suffering under stricture often assumes a pale yellow appearance, which would, at first, lead to the supposition that there was constitutional disease. By judicious treatment, particularly by the use of malt liquors, where solid food cannot be swallowed, a change for the better is very soon manifest. Where the disease is cancerous, the use of instruments increases the soreness, and they are often withdrawn covered with blood. For dilatation, the best instrument is a rod

of whalebone, with a piece of ivory on its end, of a conical rather than of a globular shape. Where the stricture is quite small, and pouched at its side, I have had most success by using a conical wax bougie, with the tip bent forward; and this will often succeed in passing the stricture, when the straight one would be caught in the sac. I know of a number of patients now living and in health, for whom I dilated strictures many years ago, who previously had not swallowed solid food for months, and in some cases for years.

The following cases, selected from a great number, are given to illustrate the treatment:—

CASE LXXII. — *Stricture of Œsophagus from Caustic Ammonia.* — In September, 1862, a young woman, 19 years of age, married, and nursing a child, came to me in a state of almost complete starvation, at that time having swallowed nothing for the previous twelve hours. She said that, about two years before, when ill, she swallowed, by accident, a tea-spoonful of caustic ammonia, instead of her proper medicine. A violent inflammation of the Œsophagus ensued, and she had not been able to swallow solid food since. She had lived principally on milk, and animal broths; but, the system being depressed from nursing, irritation had come on at the strictured part, so that she could swallow nothing. I made an attempt to pass the smallest-sized probang of whalebone, the ball on its end being about the size of a pea; but it was arrested about half-way down the Œsophagus, and would not go farther. I advised her to wean the child, and live for a few days on nutritive enemata. This she did, and was then again able to swallow liquids. On the 11th of October, she was etherized. After a number of efforts, I finally succeeded in passing through the stricture, into the stomach, a small gum-elastic catheter, with a stylet in it, bent to give it a curve forwards. This operation was afterwards repeated from time to time, without the use of ether; and I saw her last in 1865, in good health, enabled to swallow semi-solid food, but still occasionally requiring the use of an instrument.

CASE LXXIII. — *Stricture of the Œsophagus occurring after Choking.* — A lady, 35 years of age, consulted me in December, 1861, for a stricture of the œsophagus of thirteen years' standing, produced, as she supposed, from getting choked while swallowing a piece of beefsteak, which produced a severe spasm, and was finally ejected with some blood. Three years before this, a lozenge had stuck in her throat, and remained there until it had dissolved. Since the last accident, she had with difficulty swallowed any solid food. In fact, she had been gradually reduced to the necessity of using only liquid nourishment.

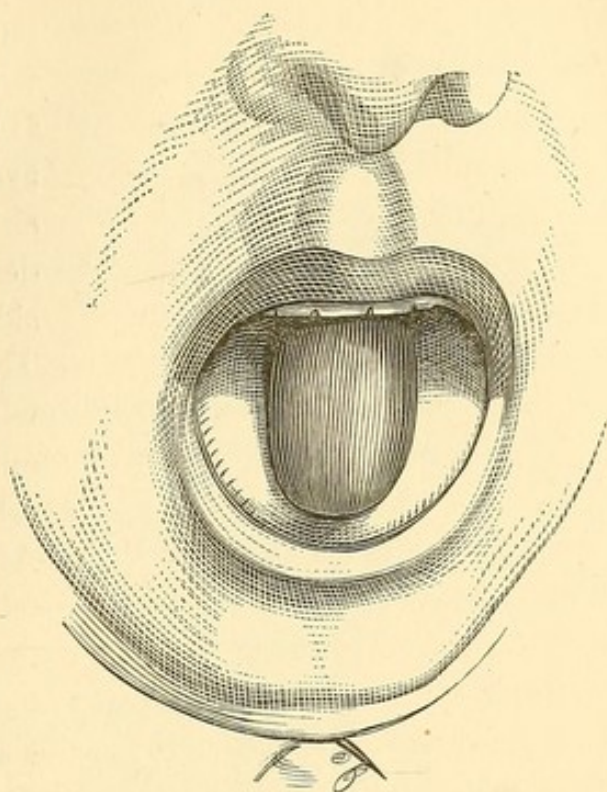
On the 3d of December, I passed a probang having a bulb the size of a pea. It went through a stricture, a little below the larynx, with some difficulty, bringing a little blood with it. She was ordered a nutritious diet, with porter. Her aspect, at this time, was that of a person with a malignant disease. A little soreness, which lasted two days, followed the operation. On the third day, the same instrument was again passed, with similar effect. The size of the instrument was gradually increased, and she was soon able to take solid nutriment. The use of the instrument was continued, at longer intervals, for a year, the power of taking solid food increasing. She now (1866) no longer requires treatment, and enjoys a moderate degree of health.

TUMORS IN ŒSOPHAGUS.

CASE LXXIV. — *Polypus of Pharynx of Large Size attached to the outside of Epiglottis. Operation. Cure.* — This case is interesting as being almost unique, on account of the size and situation of the tumor.

The patient was a gentleman, 54 years of age, who began, in 1860, to have a soreness of the throat in swallowing. About ten weeks afterwards, by a voluntary effort, a tumor could be forced up into the mouth, from the œsophagus. This did not give him much inconvenience till about three weeks since, when it began to increase rapidly, causing much trouble in deglutition.

He applied to me May 1, 1866; and I could hardly credit the statement he made with regard to the size of the tumor. By making, however, a regurgitating effort, he at once convinced me of the fact. A large, white-looking tumor, of the shape and size of a small sausage, was thrown up into the mouth. While in this position, it caused constant efforts to vomit. (*See woodcut.*)



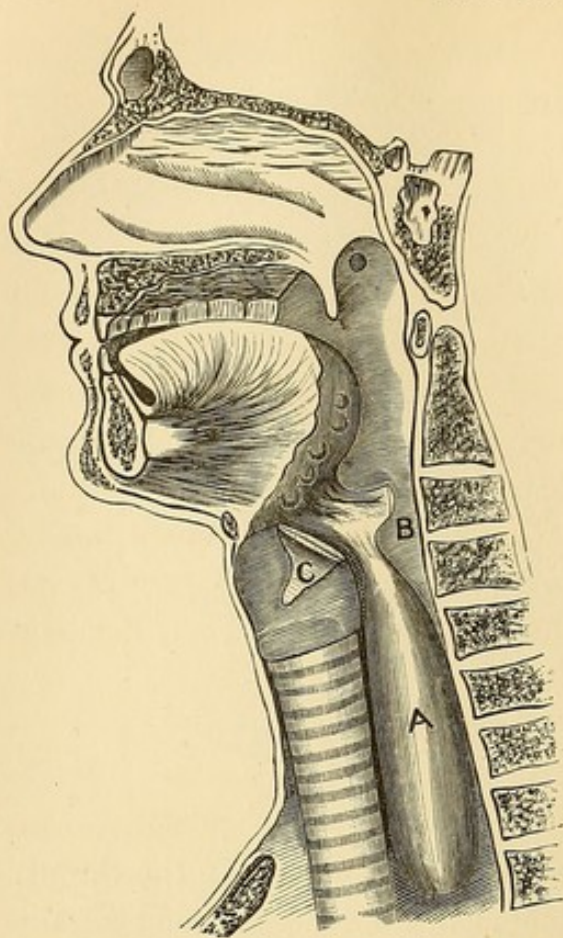
Seizing it with forceps, I passed my finger down the throat, and found that the tumor originated in the neighborhood of the epiglottis. By a slight effort of the patient, it resumed its situation in the œsophagus.

Being examined by Dr. H. K. Oliver, with the laryngoscope, its origin was found to be by a broad base, commencing low down on the left and outside of the epiglottis, which it dragged down and over to the same side: thence a ribbon-like pedicle extended into the œsophagus. On the 2d of May, it was removed in the following manner:—

Being brought up into the mouth, it was transfixed by means of a curved needle armed with a long thread so as to control it. It seemed quite vascular, and bled freely. Instead, therefore, of excising it, I passed a strong ligature down the throat, and tied it as near the base as possible. The tumor was then cut off in front, with Simpson's long curved scissors.

The portion removed was about three inches long and two inches in circumference, and of a fibrous character.

Considering the position of the ligature, in the neighborhood of the larynx, the symptoms which followed were of a mild character. There was no constitutional disturbance, and the



patient swallowed liquids without much difficulty. On the third day, a laryngoscopic examination showed the ary-epiglottidean ligament, on the left side, in an œdematous state. The ligatures, the loop of which was secured on the outside around the ear, were concealed by this swelling. After being gently drawn on for two or three days, they came away spontaneously, May 6th, bringing with them the pedicle of the tumor. The patient expressed himself greatly relieved, as was natural, from

the operation, and had no farther symptoms.

A tumor of so large a size, in this situation, must be uncommonly rare; and the only case which I have been able to find approaching it, though of a different anatomical structure, is to be found in Mr. Gibbs's valuable work on the "Throat and Windpipe," which I take the liberty to transcribe, its attachments being nearly the same as in the present one.

"One of the most remarkable on record is preserved in the museum of the Westminster Hospital, of a pendulous, fatty tumor of the pharynx and larynx, occurring in a robust and active man, *æt.* 80, who had throat-symptoms for twelve years, and four years before death, during the act of vomiting, a large mass protruded, which he was obliged to return as speedily as possible, to prevent immediate suffocation. He died suddenly, while smoking his pipe. A large, pendulous, fatty tumor was found filling the pharynx, and extending downwards into the œsophagus to the extent of nine inches. It was attached by an envelope of mucous membrane and fibrous tissue to the left side of the epiglottis, dragging it downwards and to the left side, so as entirely to prevent perfect closure of the larynx: it was

also connected with the upper part of the pharynx; but, with these exceptions, it hung perfectly loose in the pharynx and œsophagus.

“The tumor was exhibited before the Pathological Society, by my colleague, Mr. Holt; and is figured in the fifth volume of their ‘Transactions.’”

The woodcuts accompanying the present case were drawn by Dr. Oliver, and represent, 1st, the tumor as seen in the mouth; and, 2d, the supposed position of the tumor, A, in the œsophagus. The base of the tongue, the epiglottis, the larynx, and trachea are represented in their integrity, while the remaining parts are in section. The epiglottis, B, is drawn down, and to the left, by the tumor. C stands upon the greater cornu of the left thyroid cartilage, broken down to expose the parts beneath.

REMOVAL OF TONSILS.

I know no minor operation in surgery that affords greater relief and more satisfactory results than this one. I have performed it from five hundred to one thousand times, and have never lost a single patient, nor had a single case of dangerous hemorrhage; and in but two cases have I seen any such accident: both did well. The cases were not taken indiscriminately; nor was the operation performed save where the symptoms were more or less urgent, and other remedies had failed in affording relief. Many of these patients were brought from a distance, on account of the importance and severity of the disease.

In almost every instance, the symptoms were at once relieved: the patient was able to take his food with comfort; to sleep better; and exchanged a pallid and depressed aspect for a healthy and animated appearance, gaining rapidly in flesh as soon as a proper amount of oxygen was allowed to penetrate to the lungs.

In four or five instances only have I been obliged to repeat the operation. The whole of the tonsil never is, nor ought to be, removed. When the enlargement is very great and irregular, it sometimes extends down the throat, with a broad base, and it is not possible to embrace at once in the instrument as

much of the gland as it would be desirable to remove, and the apex only is excised. The consequence is, that the lower portion afterwards rises up, and comes into view, causing obstruction, and requiring another operation. These cases were, however, very exceptional.

Once I saw death occur from enlargement of the tonsils. An account of the case is given below.

In the "Philadelphia Medical Examiner," 1846, I published an account of certain deformities of the chest, attended with an enlargement of the tonsils.

The substance of the paper is contained in the following remarks : —

In 1827, M. Dupuytren published a paper on the lateral depression of the parietes of the chest, consisting of a depression more or less great of the ribs on each side, and a proportionate protrusion of the sternum in front, accompanied by some antero-posterior curvature of the vertebral column.

In 1827, shortly after the publication of this paper, Mr. Coalson, of London, published some cases in confirmation of those given by Dupuytren; adding, also, three cases of his own, of a deformity of the chest, different from that before described, the sternum being concave anteriorly, the sides of the chest very prominent, and the spinal column but slightly, if in any degree, altered from its natural shape.

In the three cases appended to the paper of Mr. Coalson, and three of the four cases of M. Dupuytren, enlargement of the tonsils existed; but in none of them does it appear that removal of these organs was practised: so that we can not judge what the effect would have been on the symptoms referred to the chest, had this operation been done.

So far as my own experience goes, this condition of the chest is partly mechanical, partly constitutional; being, in a great measure, caused, in delicate subjects, by the difficulty of respiration, from the obstruction in the throat, improving immediately when this is removed.

The operation, as performed by the present improved instrument, is instantaneous, not attended with much pain; in no case is there any considerable hemorrhage; usually, nothing

more than a few mouthfuls of blood are discharged. The patients are able to return home, and resume their ordinary occupations, as if nothing uncommon had occurred; only a slight soreness being experienced for a few days.

The following cases illustrate the symptoms of this disease :—

CASE LXXV.—*Enlargement of Tonsils in a Child of Five Years, with Otorrhœa. Excision, with Relief.*—W., of Newton, Mass., five years of age, November, 1836. For two years, this child suffered from an enlargement of the tonsils, first manifested by a swelling which appeared on the outside of the throat, and supposed to be mumps. As the disease increased, he gradually lost flesh and strength, and was subject to frequent sore throat, attended by febrile attacks, occurring as often as once a fortnight, and lasting two or three days. He breathed at night with great difficulty, and occasionally started up, as if from choking, when the sleep became profound. One ear was inflamed, and there was a purulent discharge from it: he was very sensitive to any loud musical sound. He was small of his age, thin, and of an irritable disposition. The chest was found to be much deformed, presenting that appearance called excavated sternum: it being very much depressed in its centre; and the ribs, at the union of the cartilages, elevated, so as to form with them an acute angle.

The tonsils were so much enlarged as to touch each other, and entirely obstruct the posterior part of the fauces. One of the tonsils was removed, and afforded immediate relief to all the symptoms. In the month of April following, some difficulty being experienced in breathing, the other was also excised. I saw him Aug. 3, 1837, nearly a year after the first operation. From being a miserable child, whom, as his mother stated, she had not the least idea of raising, he had become a fine, healthy boy; had been perfectly free from difficulty of respiration, and had had no febrile attack since the operation. The sensitiveness of the ear had diminished, and the deformity of the chest was much less obvious.

CASE LXXVI. — *Enlargement of Tonsils in a Boy of Eighteen Years, with Deafness. Excision, with Restoration of Hearing.* — B., aged 18, November, 1836. For two or three years, had been subject to frequent attacks of sore throat; for three months, had had a purulent discharge from the right ear; was quite deaf in both ears. He applied for advice on account of the deafness.

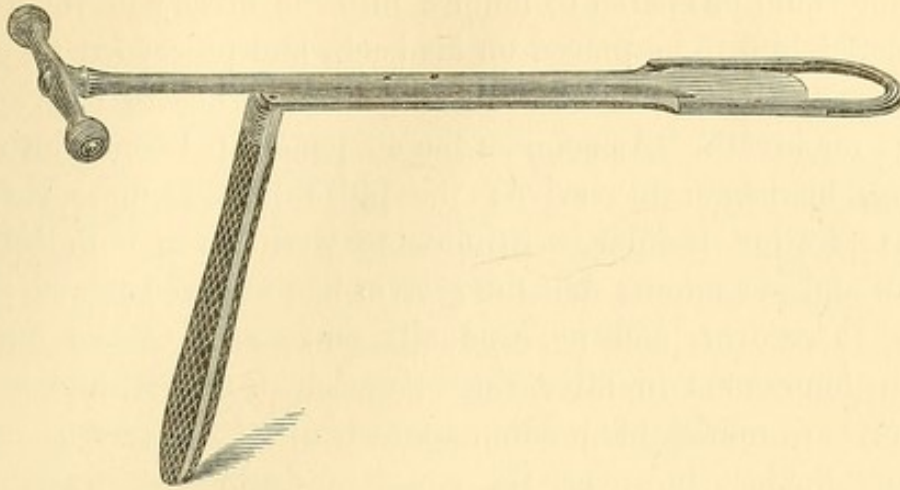
On examination of the ears by the speculum, the tympanum, of each side, was found to be in a perfectly sound state. On the side from which the discharge appeared, the lining membrane of the ear was reddened, and covered with a purulent deposit. The tonsils were found to be very much enlarged, and there was considerable redness of the back part of the fauces.

Astringent remedies being tried for a fortnight, without effect, both tonsils were removed. On the following day, he began to hear better: on the second day, his hearing was perfectly restored, and sounds even became so acute as to be painful.

In a day or two, the deafness returned, and lasted a week: he then recovered his hearing, and has remained perfectly well since. I saw him more than two years after, and he had experienced no return of his difficulty.

To these cases might be added one or two in which these organs were removed while the patient was laboring under an attack of severe tonsillitis. In one case, the symptoms were immediately removed by the operation; in another, inflammation had extended to the adjacent parts, and an abscess formed, as is often seen in this disease. The affection, however, was much shortened in duration, lasting four days instead of fourteen, as had been usual with this patient, who was liable to attacks every winter. The operation was repeated; and the other tonsil was removed, on a subsequent attack, with the same result.

The instrument used in these operations has usually been the guillotine instrument, as described by Dr. J. C. Warren in his work on tumors. It is without any steel movable needle, used to fix the tonsil and prevent it from falling into the throat, which appears to be useless, as the blade of the instrument drives the



lining membrane of the tonsil into its groove, and thus secures it; and, even if this were not the case, the mucus, which covers the fauces, causes the excised part to adhere to the blade, so that there is no danger of its escaping into the throat.

From a review of a large number of cases, I find that many of the children were of a scrofulous constitution; that the enlargement of the tonsils caused great local trouble, attended with considerable constitutional disturbance; that the patient was much more liable to inflammatory attacks of the throat, than in cases where this condition does not exist; and that they were less liable, after the operation, to these attacks.

In about half of all the cases, and in about two-thirds of those of children, deformity of the chest existed. Whether this depended on the general constitutional habit of the patient, or was induced by the obstruction in the throat to the free passage of air, the accounts received as to the exact time when either affection was first observed, were not sufficiently accurate to justify a decision. It is certain, however, that this deformity does not increase, but rather diminishes, after the removal of the obstruction in the throat. The operation is a simple one, attended with no danger, and almost always affords immediate relief to the symptoms.

CASE LXXVII. — *Strangulation from Enlarged Tonsils.*
— A man was brought into the Hospital, struggling for breath, and almost pulseless, supposed to be laboring under an attack of laryngitis. The danger of suffocation was so imminent that

no time could be spared to inquire into the history of the case. I ordered him to be placed on his back, and proceeded to open the larynx, — a matter of some difficulty, owing to his violent efforts for breath. As soon as the air penetrated freely into the larynx, he began to revive; the pulse became more steady, the respiration regular. Stimulants were given both by the mouth and per anum; but the system had received too severe a shock to recover, and he gradually sank, and expired quietly in an hour or two after the operation. On removing the larynx, no marks of inflammation could be detected. On looking further, however, the cause of death was discovered. The tonsils, greatly enlarged, and in a state of violent inflammation, filled up the posterior fauces. The epiglottis had been gradually encroached upon, so that finally it was pressed down, and almost completely prevented the entrance of air into the lungs. The history of the case, as learned afterwards from his father, was this. He had been employed, four days before, in unloading a ship; the weather being very cold and rainy. The following day, he was taken with sore throat, for which some simple remedies had been applied on board the vessel where he slept. He was first seen by a physician on the day he was brought to the Hospital.

CANCER OF TONSILS.—Cancer of the tonsils, soft palate, and uvula, is exceedingly rare. Dr. Walshe, in his work on the "Nature and Treatment of Cancer," says that cancer of the tonsils is very rare, whether of the scirrhus or encephaloid variety. He has not seen a case of primary cancer of the soft palate and uvula, nor found any recorded. "In certain cases," he adds, "where the pharynx and soft palate are implicated, it is perfectly possible that the affection may have originated in the palate, or that this part may, at least, have been the seat of separate formation; but I know of no evidence of the fact." The following case, which I attended with Dr. J. C. Warren, is one of the very few which I have seen. This one is selected on account of the remarkable transposition of the organs, which was not discovered until after death: —

CASE LXXVIII. — *Cancer in the Throat. Operation and Recovery. Death, at a Subsequent Period, from Peritoneal Inflammation. Remarkable Transposition of all the Organs.* — Mrs. A., aged 65, somewhat dyspeptic, observed, in January, 1835, a swelling on the left tonsil, which gradually increased in size; became more firm in consistence; and, finally, extended to the soft palate, and attached itself to the lower jaw so as materially to impede its motions. She was not much reduced in strength by the disease, not much emaciated: her countenance was pale, and her digestion good. The following was the state of the diseased parts just before the operation: —

On the left side of the throat, and occupying all the back part of the fauces, was a firm, indurated tumor, extending backwards and upwards into the posterior nares, and forwards to the lower jaw, to which it was firmly attached. The tonsils of that side and soft palate were also implicated. There was no doubt of the cancerous nature of the disease. The tumor was removed in June. It was of a firm, cartilaginous nature, almost of a bony hardness, somewhat ulcerated in the centre.

She recovered, though, from her age and the severity of the operation, it was some months before she was able to go about. In the month of January, 1836, having exposed herself to cold, she was seized with violent peritoneal inflammation, and died after an illness of four days. The examination of the body was made by Dr. George C. Shattuck and myself, the day after her death.

On opening the abdomen, the ordinary appearances presented by a severe peritoneal inflammation were found. The most remarkable thing, however, was a tumor in the left iliac region, at first supposed to be an invagination of the intestine, but which, on further examination, proved to be the *cæcum*; and, in tracing up the intestine to the stomach, this organ was found in the right hypochondriac region, the left being occupied by the liver.

The heart lay to the right of the spinal column, occupying a place with the right lung, which consisted of but two lobes, there being three of the left lung: the cavities were all, in like

manner, transposed. From the right auricle proceeded the four pulmonary veins: the right ventricle had the form and thickness usually possessed by the left, and contained the mitral valves. The left auricle received the vena cava, the left ventricle contained the tricuspid valves. From the right ventricle, the aorta had its origin; this, after running up a little to the left, curved over to the right, and was placed on the right side of the spinal column, having the vena cava on its left.

From the arch of the aorta, only two arteries, instead of three, were given off, forming another peculiarity in this remarkable case. The first artery to the left was the largest in size; an inch from its origin, divided into what would correspond to the innominate and right carotid. The innominate gave off the left carotid and subclavian: the other artery given off from the arch was the right subclavian. The specimen is now in my possession.

The subject of this remarkable anatomical structure was the mother of fifteen children. Nothing was observed during life to lead one to suppose that such a disposition of organs existed.

FISSURE OF SOFT AND HARD PALATE.

The operation of staphyloraphy is of comparatively modern invention. It was first attempted in Europe by Graefe (1817), and was first performed with success by Roux (1819), who seems not to have known of the unsuccessful attempt of the German professor. Shortly after, it was again performed by Dr. John C. Warren, of Boston, who, not being aware of what had been done in Europe, himself invented new instruments for it. The operation was at first deemed applicable only to fissures of the soft palate, which, of course, are almost the exceptional cases; as, out of from eighty to one hundred operations for fissure of the palate which have fallen under my own observation, in not more than a tenth, probably, of the whole number, was the fissure limited to the soft parts. Nearly all cases of fissure extending into the hard palate were rejected as unfit for operation, although Roux had suggested the idea of relaxing the soft palate by cutting it completely away from its attachments at

the posterior edge of the palate bones. This operation is very likely to prove abortive, from the division of the vessels which supply the flaps with nourishment; and, even if it succeeds, it leaves an unnecessarily large aperture in the bones, still to be covered by artificial means. Being impressed by the very great proportion of the cases of cleft palate which were deemed incurable, I was led to perform an operation for the especial relief of the more extensive fissures, which include both the soft and hard palate; and, in April, 1843, I published, in the "New-England Quarterly Journal of Medicine and Surgery," an account of a new operation for the closure of fissures in the hard palate, together with a very important modification of the operation of staphyloraphy, as practised for the relief of fissures of the soft palate. The operation upon the hard palate (I quote from the description of my first case as reported at that time) consisted in "dissecting up, with a long, double-edged knife, curved on its flat side, the membrane covering the hard palate, pursuing the dissection quite back to the root of the alveolar processes. By this procedure, which was not effected without considerable difficulty, the membrane seemed gradually to unfold itself, and could be easily drawn across the very wide fissure. A narrow slip was now removed from the edges of the soft palate, and with it the two halves of the uvula. By this means, a continuous flap was obtained, beginning at the roots of the [incisor] teeth, and extending backwards to the edge of the velum palati. Finally, six sutures were introduced, on tying which the whole fissure was obliterated. . . . This patient returned home into the country at the end of three weeks; a firm, fleshy palate being formed behind, and half the fissure in the bony palate obliterated. In the following spring, I again operated on the remaining fissure in the hard palate, and succeeded in closing half the extent of it; the tissues yielding with some difficulty, owing to the induration caused by the former operation. The small aperture which remained, I directed to be closed by a gold plate." I had, at this time, operated in this manner in fourteen different cases, "which, with one exception, had terminated successfully, either in the closure of the whole fissure of both hard and soft palate, or so far that the

aperture which remained in the bones could be easily closed by an obturator fitted to the adjoining teeth."

The improvement to which I have alluded, in the operation upon the soft palate, consisted in the relaxation of the tissues of the fissured velum, by means of incisions, made with strong curved scissors, so as to divide the attachments of the soft palate to the tonsil and to the posterior pillar; or, in other words, dividing the posterior pillar of the palate just where it begins to spread out into the velum. The effect of this incision is at once seen in the almost complete relaxation of the parts, so as to admit of their easy approximation and union by suture. At this time, I had met with no case in which this procedure failed to relax the parts, as I thought, sufficiently for the requirements of the operation; and, in the fourteen cases of operation for complicated cleft palate which I had then performed, I had met with but one unsuccessful result. In subsequent operations, however, I found that there existed, in some cases, an additional obstacle to the approximation of the flaps, which could be overcome as easily, and in the same manner, as the former. This obstacle consists of a band of firm tissue, extending above and behind the soft palate, and standing out in bold relief when that organ is put on the stretch by drawing upon it with the forceps. This resisting mass, like the other, I have always divided by an additional stroke or two with the scissors, whenever the incision of the posterior pillar and adjacent mucous membrane has seemed insufficient properly to relax the palate. By this division of all the parts which oppose any active resistance to the approximation of the sides of the fissure, the operation, as I have performed it, was finally perfected in its essential features; and, since that time, I have known of no important improvements in it, except in a few matters of operative detail. During the past few years, however, I have generally abstained from the attempt to effect the entire closure of very extensive fissures in the hard palate, owing, in part, to the severity of the operation, but chiefly to the fact, that modern improvements in mechanical dentistry have furnished us with a most efficient and comfortable substitute for the natural hard palate, in the form of a metallic or hard rubber plate.

By the introduction of these improvements in the plan and methods of operating, the surgery of cleft palate at once acquired a new and vastly enlarged importance. The operation of staphyloraphy, as invented by Roux, and practised by many surgeons, both in Europe and America, had been considered applicable only to simple fissures of the velum, a class of cases constituting but a very small fraction of the total number of cleft palates, and the very ones in which the need of surgical aid is least urgent.

The highly successful results, however, which I was enabled to report in the treatment of cases which had previously been considered as beyond the aid of surgery, together with the encouraging success which had been already attained by Roux, Dieffenbach, and many other surgeons, from the operation in the soft palate, soon excited the renewed interest of the profession in this most distressing deformity.

Mr., now Sir William, Fergusson, was led, in 1844, by the dissection of a specimen of cleft palate, to adopt a method very similar to mine; dividing the levatores palati muscles, with a slender curved knife, somewhat higher than in my procedure with the scissors, and dividing the posterior pillars of the palate in precisely the same manner as I had already described.

The subject of cleft palate has been still further illustrated by several British surgeons of distinction; among whom Messrs. Avery and Pollock of London, Mr. Collis of Dublin, and Mr. Field of Brighton, are especially prominent. All these gentlemen have operated with the most perfect success upon fissures as well of the hard as of the soft palate, and they have all adopted the plan of separating the soft textures freely from the palatine arch. Mr. Pollock divides the palate muscles by a partially submucous incision, at a point near the hamular processes, where the fibres begin to spread out into the velum.

The following account of the different stages of the operation, as I have lately performed it, very nearly resembles that which I published in 1843, to which allusion has been made:—

1. *The Separation of the Palatine Membranes from the Bones.* — This procedure I have found necessary in fully nine-tenths of the cases upon which it has been my lot to operate. In most of the fissures which apparently extend only to the margin of the bony vault, the top of the fissure is of a rounded rather than an angular form, so as to render it difficult or impossible to bring the flaps together at this part without first loosening their attachments. By adopting this measure, however, the upper sutures are applied as easily as the lower ones; and the danger of partial failure at this particular part of the palate, formerly so common, is almost wholly obviated. In cases of more extensive fissure of the hard palate, this separation is to be carried further, in some instances even to the alveolar processes. I have always completed the operation, as far as I have thought it proper to attempt it at all, at a single sitting, because in this way we are almost certain to obtain good union of the velum, and a partial closure, *par glissement*, of at least the posterior portion of the fissure in the bones. Whenever, by the re-establishment of the velum and of the posterior part of the palatine vault, we have succeeded in reducing the fissure to a simple foramen in the hard roof of the mouth, we have practically relieved the patient from his disgusting and distressing deformity; for he only needs a light metallic or vulcanite plate, such as is now worn by every one who has a set of false teeth, to enable him to articulate as well as if the aperture were closed by the natural bone and membranes. Led by these considerations, and by the desire to shorten as much as possible an operation which must almost necessarily be performed without the aid of anæsthesia, I have ceased, of late years, to operate for the closure of the anterior portion of the cleft in extreme cases; and this notwithstanding the fact, that, in my earlier years of practice, I succeeded in completely closing a very large proportion of all the fissures upon which I operated, including some very extensive ones, and thus established the operation as a perfectly practicable one. In commencing this part of the operation, I have always used a knife substantially like that which I first employed; viz., a double-edged, spear-pointed knife, strongly curved on its flat side; which I have

found to answer well for almost all fissures of moderate extent, although in some extreme cases, in which the bones have deviated widely from their normal curvature, very considerable difficulty has been experienced in making the first incisions at the edges of the fissure. In these cases, there is often no proper roof to the mouth, owing to the extreme obliquity of the bones, which rise, as it were, almost vertically from the alveolar margins towards the nostrils. To facilitate these first incisions in such cases, it has been proposed by Dr. Smyly to commence the dissection with a slender knife, shaped somewhat like an ordinary gum-lancet, and used through the nostril, where the edge of the fissure may be more readily reached than from the mouth. Sharply recurved knives, worked from the mouth, have also been used for the same class of cases; and a particularly ingenious one has been invented by Mr. Pollock, in which a short chisel-shaped blade is attached to a metallic stem by means of a hinge, and is fitted with a screw movement by which it may be adjusted to any required angle. Both these contrivances have been tried and approved by Mr. Collis, and are doubtless of great utility in the cases for which they are designed. This commencement of the dissection at the edges of the fissure is by far the most difficult part of the operation; for it is at this part of the palate that the membranes are always found most firmly adherent to the bones. As we proceed, however, the separation becomes very much easier, and the membranes seem almost to peel off from the bones. I have therefore, at this point, generally abandoned the knife, and have continued the dissection, as far as I have thought necessary towards the alveolar processes, by means of curved scissors. In this way, I have been sure of preserving the greatest possible thickness of tissues in the flaps, without endangering their nutrition by the division of the palatine arteries. In most of the cases which I have seen, there has been little or no deficiency of materials to fill the gap; but the fissure has been the result rather of the oblique direction of the ununited sides of the palatine vault. The operation consists, then, not so much in stretching the flaps tightly across the cleft, as in bringing them into a more nearly horizontal position. I have not, therefore, seen that much

benefit is to be expected from lateral incisions through the palatine membranes, and have always abstained from making them, from the fear of causing needless and troublesome hemorrhage, and thus unnecessarily prolonging an already too tedious operation. At the posterior edges of the ossa palati, the union between the soft parts and the bone is very intimate, owing to the insertion there of the tendinous fibres of the velum, and more particularly of the reflected tendons of the *tensores palati* muscles. For completing the separation at this point, I use a pair of probe-pointed scissors, which I have found to divide the firm tissues much more conveniently and expeditiously than any knife. In all the operations which I have performed, I have met with but a single case of troublesome hemorrhage. At the moment of freeing the flaps from their attachments to the posterior margins of the palate bones, a few arterial twigs are generally divided; but I have always been able to control the bleeding by the use of iced water. In a single instance, however, in which the upper stitch was unusually tense, the bleeding continued after the adjustment of the sutures, but immediately ceased when the stitch was divided so as to allow the membrane to apply itself more closely to the bone.

2. *The Relaxation of the two Halves of the Velum by the Division of Resisting Bands of Muscle and Mucous Membrane.* — This has been a most important feature in all the operations, and is still performed in the same manner as in the earliest cases. The instrument employed is a pair of large and strong French scissors, curved on the flat side. One of the halves of the split uvula is seized with appropriate forceps, and drawn across the fissure. This brings out in bold relief two strongly resisting bands, one below and one above the palate. The former, consisting of the posterior pillar of the palate, is then divided by a powerful stroke of the scissors, and the incision extended forwards and backwards, dividing as much of the mucous membrane as may be necessary to relieve all tension at this part. The other band, consisting chiefly, as Sir William Fergusson has shown, of the levator palati muscle, with its mucous coverings, is next divided in the same manner as the posterior pillar, including, as before, in the incisions, a greater

or less extent of the adjacent mucous membrane, as may seem to be requisite to effect the perfect relaxation of the organ. The completion of this stage of the operation is shown by the striking change in the condition of the half of the velum, which, from a state of violent spasmodic contraction, burying itself, as it were, in the side of the throat, becomes perfectly flaccid and powerless. As soon as this result is attained, this part of the operation is to be considered as finished, whether the incisions have been more or less extensive. By this method, no part is divided until it has been first brought into a state of tension, and thus shown to require it. For facility and certainty of execution, dividing no more and no less than is required, and for absolute freedom from danger, it seems to me that this method of relaxing the soft parts has never been surpassed. That other plans may be useful, I have no doubt; but whether they offer advantages equal to the present can be settled only by a series of comparative trials in practice, such as have not yet been made.

3. *The Paring of the Edges of the Fissure.* — This is performed sometimes with scissors, and sometimes with a slender, pointed knife; and I am not aware that there is any decided preference to be given to either method. The edge of the flap is made tense by drawing upon the uvula with a pair of strong but slender-toothed forceps, which I have devised for the purpose, and which is shown in the plate. These forceps, of which two pairs are required for the two sides, are made with a double curve, and are so contrived as to seize the extreme edge of the palate without encroaching more upon one surface than the other. The same forceps are employed also in the preceding stage of the operation to put the palate on the stretch; and, as a general rule, after once seizing the organ, I do not let it go again until I have pared its edge. I have not found it desirable to attempt to preserve the whole uvula; for it generally hangs so low in the throat as to cause irritation, and thus interfere with the success of the operation. In most cases, therefore, I remove the greater portion of the two halves of this appendage at the time of paring the edges of the palate.

4. *The Application and Adjustment of the Sutures.* — In

the early days of staphyloraphy, this was by far the most difficult and vexatious part of the operation, owing to the extreme irritability of the parts provoking violent muscular retraction whenever the flaps were pricked by the needle. After adopting the plan described for the relaxation of the organ, I observed that this stage of the operation was greatly facilitated; so that, for a number of years, I was in the habit of passing the sutures with a small curved needle held by forceps. Increased experience has, however, demonstrated the usefulness, in many cases, of the ingenious *crochet-aiguille* of Schwerdt; a sharply recurved needle, mounted in a handle, and having an eye at its point which can be opened and closed by a slight pressure upon a spring. The instrument is threaded, and passed through the edge of one of the flaps from behind forwards, and one end of the thread drawn through by catching the loop with a tenaculum or hook. The needle, still threaded, is then withdrawn, and carried through the flap on the opposite side; the eye is then opened, and the thread wholly disengaged from it by drawing upon the loop. I have generally adjusted the middle suture first, by that means controlling the palate, and thus rendering the insertion of the others easier. The lower one is best inserted last. At the lower part of the palate, where the parts are very movable, I have found it difficult to fix them with this instrument, and therefore prefer to use a delicate curved needle held in a *porte-aiguille*. The chief objection to the needle of Schwerdt is the difficulty of keeping it sharp, owing to its being split at the point. Very broad sutures, made of a number of waxed threads arranged in the form of a flat band or tape, have been much employed in France; and Dieffenbach used to insist strongly upon the advantage of using wires of soft lead. I have always used a single thread of common surgeon's silk, thoroughly waxed, and tied with the ordinary surgeon's knot. I have prepared the silk, at the suggestion of Dr. C. G. Page, by soaking it, a day or two beforehand, in the compound tincture of benzoin, by which it acquires an adhesive property, and is less apt to slip when the knots are tied. It is important to bring the opposite edges of the fissure into absolute contact with each other without much tension, or the stitches will

as certainly cut their way out, and thus defeat the end for which they are employed. In an interesting case of operation for the closure of a very extensive fissure of the hard palate, performed by Mr. Collis, and reported in the "Dublin Quarterly Journal of Medical Science" for February, 1865, the flaps, although of ample breadth, tended obstinately to revert to their original position in contact with the bones, and thus caused injurious tension upon the stitches. This was overcome by the very happy and ingenious expedient of pushing the flaps, as it were, towards the median line, by means of wedges of sponge introduced between them and the bones: these were easily removed through the nostril, after forty-eight hours, and the result was a nearly complete and most satisfactory union.

5. *The After-treatment.*—This was formerly the severest and most vexatious part of the management of the case, owing to the supposed necessity of the interdiction of the use of food for several days following the operation. In my first cases, I pursued this plan, nourishing the patients for several days solely by enemata. The obviously unfavorable effect of thus starving a person in full health, and accustomed to a generous diet, led Sir Philip Crampton, of Dublin, to try the experiment of allowing his patients an ample supply of soft food, such as boiled bread and milk, custard, soup, jelly, &c., during the whole period of the treatment. The publication, in January, 1843, of the two cases in which this plan had been successfully tried, was immediately followed by the abandonment of the old and most irksome restriction; and patients are now allowed as much liquid or semi-solid food as they desire. Much trouble is often experienced, after the first three or four days, from the secretion of tough adhesive mucus in and around the line of suture, which gives rise to an irritating cough of such severity as sometimes to threaten the destruction of the newly formed adhesions. In this condition of the parts, I have seen much benefit from the use of warm or acid drinks, or from brushing the parts with a weak solution of nitrate of silver.

At first I was disposed to remove the sutures at the earliest

possible period; but latterly, from having once had all the adhesions give way during the act of withdrawing the threads, I have allowed them to remain a very long time. It is rather important that the mouth should not be too widely opened during the early stages of the adhesive process. Once, on the fifth or sixth day, I have known the entire wound to give way, from the patient opening the mouth too widely for the purpose of inspection.

The number of cases of cleft palate upon which I have operated by these methods is now about a hundred: of this number, in less than one-tenth was the fissure confined wholly to the soft parts; and, in at least three-fourths, the gap extended into or through the maxillary portion of the palatine vault. In not more than nine or ten cases, therefore, have I found it practicable to close the fissure, without first dissecting up the membranes from the posterior part of the hard palate, and cutting through the tendinous attachments of the velum to the ossa palati. I have in no case been deterred from operating by the extent of the deformity; and, in several cases of most formidable aspect, I have succeeded in improving the voice and facilitating deglutition, as completely as in even the simplest fissures of the velum. In one case of simple fissure of the soft palate, I was tempted to operate without first dividing the muscles. The edges of the fissure came so easily together, that any farther incisions seemed unnecessary; and for several days every thing looked fair. About the seventh day, however, the adhesions gave way, owing, as I believe, in part at least, to the imperfect method adopted. As to the proper age at which to operate, in one case of a fissure which extended but little more than through the uvula, I operated on a child of between six and seven years; but generally it is necessary to wait until the patient is old enough to fully appreciate the importance of the operation, and to submit patiently to pain and inconvenience: for this is one of the very few operations in which the use of anæsthetics is inadmissible. Under very peculiar circumstances, I suppose, ether might be administered, but not without some risk to the patient, and much embarrassment to the surgeon, from the constant flow of blood down the throat.

The result of these operations may be stated briefly as follows: With the exception of perhaps half a dozen cases, I have never failed to get more or less union of the soft palate. Sometimes one, or more rarely two, of the sutures have given way at the upper part, where the tissues are put most fully on the stretch. If any of the stitches hold, however, and the smallest union takes place, it may be afterwards extended either by the renewal of the sutures, which is now a comparatively easy matter, or by the occasional application of the solid nitrate of silver to the angle of the remaining fissure. The great point is to establish the arch of the soft palate as completely as possible; and, when this is once accomplished, any aperture which may remain in the hard palate can be effectually closed by simple mechanical means. In cases of extreme fissure extending through the alveolar arch, where a few artificial teeth are almost always required to fill the gap caused by the lost or distorted incisors, the plate upon which the new teeth are mounted serves also to close the remaining cleft in the roof of the mouth. Of course, in all cases, the more completely the fissure can be closed by the operation, the better it is; but what I wish particularly to enforce is the fact, that, even in the extreme cases of very wide fissure in the bones, an operation can be performed which is as effectual in restoring the voice, and almost as easy of execution, as in cases confined to the velum or extreme back part of the palatine vault.

The question is often asked of the surgeon whether the voice will be immediately restored by the operation; and, if not, in what time the full restoration may be expected. The answer must, of course, be very indefinite; for, in fact, the patient has now to learn, for the first time, the art of using the palate in articulation. Almost every patient, after the opening is entirely closed, experiences a sense of relief, which is owing both to the greater ease with which deglutition is performed, and also to the protection afforded by the new palate to the mucous membrane of the posterior fauces, which, before the operation, was dry and parched from the constant passage of the air over it. I have lately had occasion to see several patients two or three years after the operation. Two of them are teachers in public institutions;

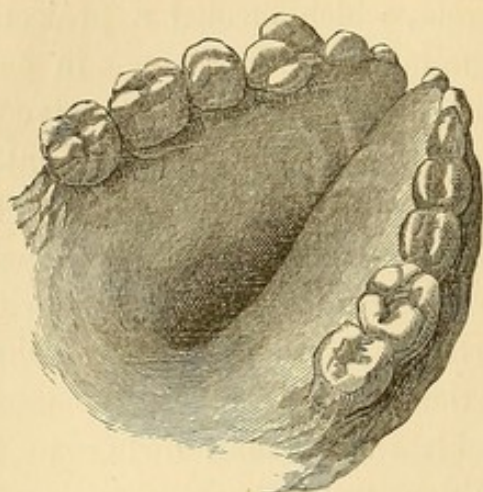
and the only defect to be perceived is a slight huskiness of the voice, which would hardly be noticed by any one ignorant of their former condition. I do not remember to have seen a case in which the patient was not materially benefited.

These remarks are condensed principally from a report made to the American Association in 1865, and borne out by farther experience. It is thought unnecessary to introduce cases in illustration, which is done in that paper, farther than one or two which are remarkable for some peculiarity.

CASE LXXIX. — *Congenital Fissure of the Soft and Hard Palate, with Double Harelip.* — Patient 20 years of age. By an operation performed on the lip, six years before, the intermaxillary bone had been almost wholly removed: as is usual after this operation, the maxillary bones had been dragged into contact with each other in front. The palatine processes of the maxillary and palatine bones seemed almost wanting, and the whole arch was very narrow. *Operation:* From the extreme deficiency of the bony vault, the membranes could not be made to come together across the gap. The velum, however, united. After a fortnight, finding that the coverings of the hard palate had become very much thickened, I again dissected them up, and this time was able to unite the flaps by suture. *Result:* Partial closure of the gap left after the first operation, with a thickened, fleshy state of its edges, which seemed to promise a still further diminution in its size, or possibly even its entire obliteration. The remaining hole, which was quite small, was closed by two bits of elastic vulcanized India-rubber, stitched together in the form of a shirt-stud. A plastic operation was afterwards performed upon the lip and nose, with the effect of very greatly improving the appearance of the patient.

CASE LXXX. — *Fissure of the Hard and Soft Palate, with Median Fissure of the Alveolar Arch, and Double Harelip.* — The patient was a young man, 17 years of age, upon whom a very dexterous and perfect operation for double harelip had been performed in infancy, by my friend Professor Willard Parker, of New York. At that time, as Professor Par-

ker has kindly informed me, he removed, from the extremity of the vomer, a small osseous tubercle, which formed a projection similar to that often caused by the intermaxillary bones in cases of double harelip complicated with double fissure of the alveolar arch. I had been consulted, from time to time, on account of the cleft in the palate; but it was not until he had attained the age of seventeen years that he finally came to me for an operation. This was performed in the manner already described at length, with the result of perfectly re-establishing the velum, and covering the posterior portion of the cleft in the bones. The operation was more difficult than usual, owing to the small size of the mouth, resulting from the previous operation on the lip, and the unusual obliquity of the two ununited halves of the palatine vault; yet the improvement in articulation was more speedy and more decided than I remember ever to have observed in any other case. A very few weeks after the operation, he was able to wear a gold plate, which was made for him by Dr. Rufus E. Dixon, of this city; and it was at this time that my attention was particularly attracted to the alveolar arch and the anterior portion of the fissure. The upper lip was so closely applied to the teeth in front as wholly to conceal them, except when lifted with the fingers. A glance at this part of the mouth revealed a remarkable deviation from the ordinary condition of the jaw in this deformity, inasmuch as it showed the existence of a perfectly symmetrical median fissure extending completely through the alveolar arch, between the central incisor teeth. Upon the right side of the cleft were seen the first and second permanent incisors; then the canine tooth, out of line, and placed rather above and in front of its normal position; then the two bicuspid; and, lastly, the two molars. In front of and above the right lateral incisor was the corresponding milk-tooth, hanging quite loose in the gum. Precisely the same number of teeth existed on the left side of the cleft, even to the presence of the lateral incisor of the temporary set. The central milk-incisors had also formerly existed, one upon each side of the fissure; but had been removed, a few years before, on account of a tendency to cross each other, and press against the lip. At my request, Dr. Dixon removed the two remaining



milk-teeth, and also the right central incisor, of the permanent set, which seemed disposed to take an awkward position as regarded both the lip and the jaw. A cast of the mouth has been preserved and figured, showing the position of the fissure and the arrangement of the teeth. See *woodcut*.

The woodcut presents the state of the parts in the case of median fissure. Being taken from a cast made after the operation, it shows the restoration of the posterior part of the hard palate, together with the velum: it serves also to give a general idea of the extent to which it is aimed to close extensive fissures in the bony arch.

This is, so far as I am aware, the only case ever observed of a true median fissure of the alveolar arch, or, in other words, the only one in which the cleft has been seen to occupy the position of the line of suture which separates the two intermaxillary bones from each other. In all cases hitherto noticed, the cleft in the alveolar arch has been upon one or both sides; corresponding, in most cases, to the line which marks the union, in early fetal life, of the maxillary with the intermaxillary bones.

CASE LXXXI. — *Fissure of Hard and Soft Palate. Double Harelip, operated on 17 years before. Operation. Cure.* — The following case is interesting, as showing the anatomical appearances presented by the palate in a person 19 years of age, who had been operated on seventeen years before for double harelip, with removal of the intermaxillary bone. The lip was short and contracted, and presented a large red place in its central part, produced by the prolabium, which ran quite up, through the whole central region of the lip, to meet the middle

portion of skin which covered the intermaxillary bone. This had not been worked into the lip as is generally done, but simply formed the septum of the nose. The result demonstrated this advantage, that no scar was left, as usual, leading to both nostrils; but the cicatrix on the right side was concealed above in a plait of skin, that on the left side being alone visible. This result was dependent probably upon the fact, that the operation had been performed at two separate times upon the two sides of the lip. The case suggested the idea, that, if the intermediate portion of skin were more fully removed, and only sufficient left to form a septum for the nose, the scar afterwards, instead of presenting the unsightly form of a letter Y, would have the simpler form of a single cicatrix in the median line. The appearance of the bones was as follows:—

The maxillary bones had not come together, but were separated by an interval of at least an inch. The first teeth upon the sides were the canines; and there were, upon each side of the jaw, five teeth above and seven below. The vomer was central over the back part of the fissured palate, which is generally the case in simple cleft palate uncomplicated with harelip; but in front it curled to the right side, and seemed to unite with the anterior part of the upper jaw. It resembled, to a certain extent, a fissure of the palate complicated with harelip on one side only, in which case the vomer is generally continuous with the palatine plate of one side. What the nature of this apparent union was, does not exactly appear, when it is remembered that the intermaxillary bone, which is always attached to the end of the vomer, had been removed. It is possible, that, from the early age at which the operation had been performed upon the lip, these parts may have been drawn together, and coalesced.

I operated on this young man in June, 1863, for the fissure of the palate; the operation being perfectly successful. An artificial plate, with incisor teeth attached, was afterwards introduced to fill the gap in the jaw, and cover the remaining fissure in the hard palate in front.

The following observations were made eighteen months after this operation, when the patient consulted me medically. As

regards the restoration of the voice, it was less than in the greater proportion of cases in which I have operated; for what reason I could not exactly determine, as the soft palate was quite flexible, was united as low down in the throat, and protected the fauces as well, as in the natural state of the organ. The improvement, as regarded comfort in breathing and deglutition, was very great; as previously he could scarcely take liquids without a portion being rejected by the nostrils.

DESCRIPTION OF PLATE.

INSTRUMENTS EMPLOYED IN OPERATIONS FOR CLEFT PALATE.

Figs. 1 and 1*a*. Forceps for seizing and holding the edge of the fissured velum. They are in pairs, one for each side of the fissure; Fig. 1 being for the left side, and Fig. 1*a* for the right.

Fig. 2. Strong French scissors curved on the flat side, shown in profile in Fig. 2*a*; used for dividing the posterior pillar and other resisting bands, and for paring the edges of the fissure.

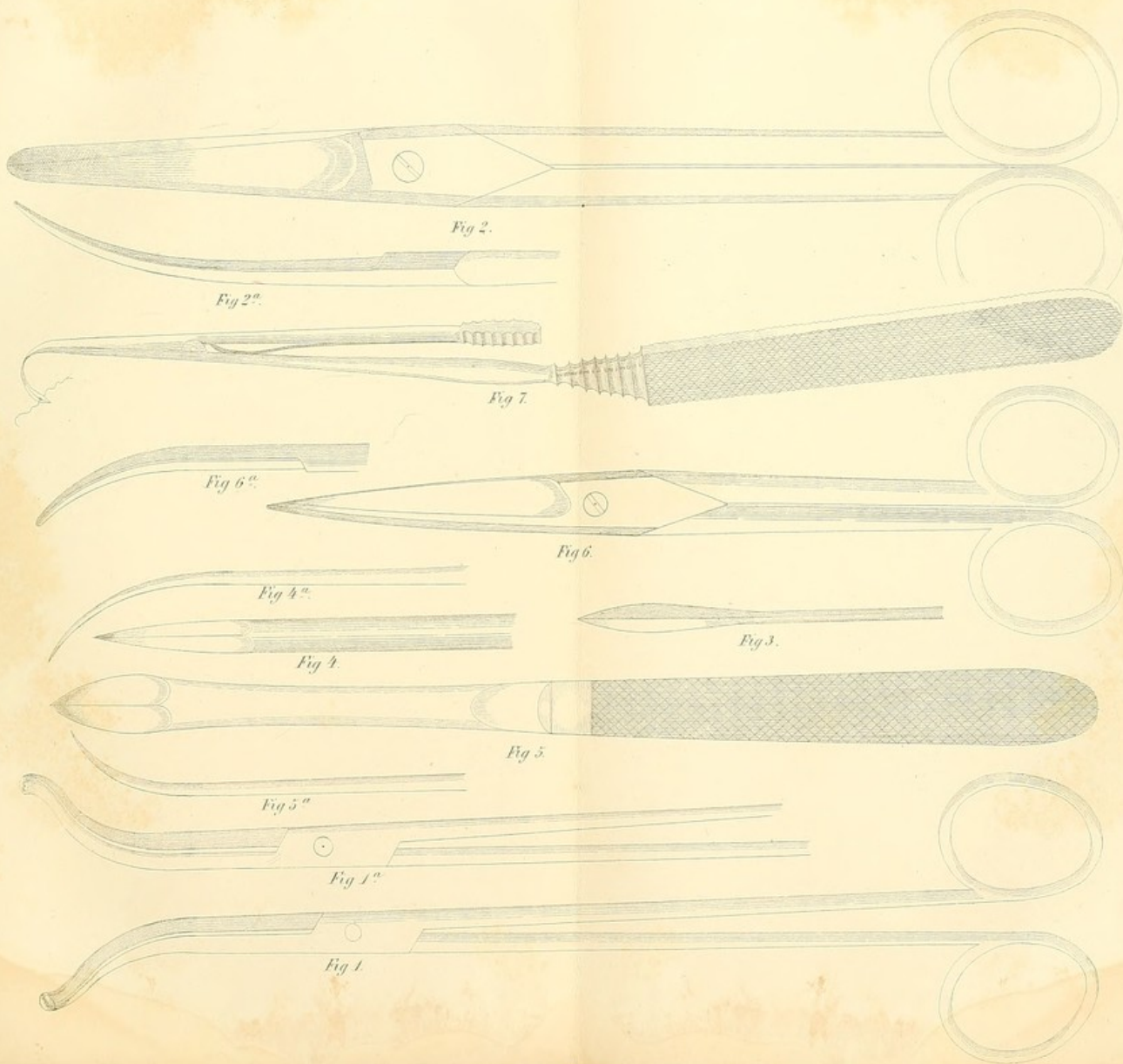
Fig. 3. Slender spear-pointed knife, which I have sometimes used to pare the edges of the fissure.

Fig. 4. Curved spear-pointed knife, shown in profile in Fig. 4*a*, which I originally employed in separating the membranes from the palatine vault.

Fig. 5. A knife similar to the former, represented also in profile in Fig. 5*a*, but broader and shorter in its curve. This is the knife which I have used, for the last ten or fifteen years, in commencing the dissection of the covering of the hard palate.

Fig. 6. Curved scissors, smaller than those shown in Fig. 1, and with points nearly sharp; used in completing the dissection of the membranes from the bony palatine vault. Shown in profile in Fig. 6*a*.

Fig. 7. Crochet-aiguille of Schwerdt, represented as closed, and with a thread in its eye. By pressing upon the lever, the eye is opened, and the thread disengaged.





HARELIP.

It is of much importance for the future appearance, and even for the health, of the child, that this operation should be well done, and the proper time selected for it. I have performed it, with success, as early as seven hours after birth; and its early performance was advocated by my grandfather, Dr. John Warren. Dr. A. L. Peirson, of Salem, has also published a paper advocating this being done early. On the whole, after much experience, I should advise the age of three or four months, just previous to teething, and after the tissues have acquired sufficient firmness, as the best age to select.

For many years, I have advocated nursing immediately after the operation, and while union is going on. By this means, the digestive organs are kept in a good condition, and diarrhœa avoided, which was often produced by change of diet when feeding was formerly practised. The muscular action of the lip, induced by nursing, rather favors the coaptation than the separation of the edges of the wound, though formerly the contrary was supposed.

I am convinced that sutures are much preferable to needles, no matter how wide the separation, and consequently great the tension required to bring the parts into contact. They have these advantages: first, they are more easily introduced; second they produce less irritation; and, third, they can generally be removed at the expiration of forty-eight, or, at the most, of seventy-two hours, without danger of disturbing the tender adhesions. On the other hand, if needles are used, they must be left until they are sufficiently loosened by ulceration, otherwise there is great danger of tearing open the wound. The part of the lip also embraced by the figure of 8 over the needles is often left in an excoriated state.

When the stitches are used, the intervening parts are exposed, so that the process may be watched; and, by the application of a small compress kept constantly wet with water, the inflammation liable to occur in very young subjects is so moderated, that, on the removal of the sutures, I have frequently found the line

of adhesion quite perfect, free from redness, and after a short time scarcely to be distinguished. In fact, the tissues seem to melt into each other, without any perceptible cicatrix remaining.

Small, straight suture-needles, held firmly by forceps, will be found much more convenient to use than curved ones.

In regard to the method for avoiding the irregularity which so often takes place where the edges of the lip are brought together, I should say (having tried the various means that have been suggested by cutting the edges of the lip irregularly), that the only sure way is to remove a liberal portion of the margin of the fissure beyond the red border just before it begins to curve upwards. The union of the parts is much facilitated by taking a very fine stitch on the inside of the lip. No dressings are required until the stitches begin to loosen, then a piece of adhesive plaster of a dumb-bell shape is of much assistance in maintaining the apposition of the two sides. With infants, the hands should be secured during the treatment, as I have known a single blow defeat the whole operation.

CASE LXXXII. — *Operation for a Harelip on a Child three days old. Icterus. Hemorrhage. Remarkable Closing of the Fissure.* — The child was a fine one as to size. He was first seen by me on the day of the operation. During the operation, it was observed that there was a yellow tinge about the eyes and forehead. This was so slight as not previously to have attracted attention. When the incisions were made, I remarked to the bystanders that the bleeding was unusually free, the blood being dark-colored, and coming from the whole cut surface. The bleeding, however, ceased; and the wound was brought together by sutures. A wet compress was applied. Suspecting something wrong, I visited the child an hour afterwards. I found the lip swollen, and bleeding quite freely. All other means failing to arrest the hemorrhage, it was found necessary, in order to save the life of the patient, to cut away the stitches, and to include the whole cut edges in a series of ligatures. Considerable inflammatory action followed; but, at the end of a month, the whole wound was entirely healed, leaving the fissure, of course, much larger than before

it was interfered with. Shortly after this, a contraction of the parts took place, commencing at the upper end of the fissure, and gradually extending downwards so as ultimately to produce complete obliteration, no scar being left except on the very edge of the lip, which was rather projected downward than hitched up, as it often is after the operation of a harelip. The process of closure, in this case, was so remarkable as to demand special attention. The occurrence of hemorrhage in connection with the symptoms of jaundice is interesting. Dr. Francis Minot, in a valuable paper, read to the Boston Society for Medical Improvement, has shown that out of thirty-nine cases of umbilical hemorrhage, thirty-two had jaundice. It has also been shown, that the bleeding from wounds of icteric patients is arrested with difficulty. It therefore seems proper to avoid operating upon patients in this condition, if possible, until the symptoms of jaundice have passed away.

CHAPTER IV.

CHEST.

PARACENTESIS THORACIS.

THE operation for the removal of fluids from the cavity of the chest, by puncture, or by the introduction of the trocar and canula, has been for a long time employed in the practice of surgery. The cases, however, which generally fall under the hand of the surgeon, are those of chronic disease where collections of pus have taken place. In these cases, the simple withdrawal of the fluid, followed in some instances with iodine or other injections, does not seem to accomplish the object; and I have once or twice made incisions into the chest afterwards, or left the canula in place to allow the escape of the fluid as soon as formed, before a cure was accomplished.

The existence of a connection between the bronchial tubes and the pleuritic cavity, allowing the escape of air into it, has not been an objection; the aperture in the lung being obliterated as that organ expanded.

In tuberculous cases, the relief afforded, in general, is but temporary. It is in cases of simple pleurisy, with effusion of serum or pus into the pleuritic cavity, that the great benefits of the operation are observed. In one or two cases where a spontaneous or artificial opening has become fistulous, — the passage being narrow and devious, — I have seen serious irritation set up, giving rise to hemorrhage more or less severe, and leading to the supposition that it was caused by a carious condition of the rib from the long contact of pus with it, which occasionally is the fact. These symptoms have all been relieved by making a free incision into the cavity of the chest; one or two cases requiring the removal of a portion of the rib in order to keep the aperture freely open, owing to the thickness of the pleura from inflammatory action.

A caution may be given in some old cases in regard to puncture when the pleura has become excessively thickened. The instrument should be driven in with a certain amount of force and decision; otherwise, the pleura is forced before its point, and no fluid is supposed to be present, when, in fact, the cavity of the thorax has not been entered.

Of late years, the removal of recent effusions of fluid has been practised in our vicinity with most successful results by Dr. Morrill Wyman, of Cambridge, Dr. H. I. Bowditch, and others, by the use of a small canula, with suction applied by means of a syringe, so as to prevent the admission of atmospheric air.

CASE LXXXIII.—*Empyema. Fistulous Communication with Lungs. Paracentesis Thoracis. Cure.*—The patient was a young man, aged 20, of good constitution, and not of a tuberculous family. In March, 1853, he was seized, after exposure to cold, with a severe pain in his right side, which confined him for six weeks to his house and bed: it was not attended with cough or expectoration. After this period, he went out, and was able to employ himself partially in his ordinary avocations. In June he was suddenly seized, while at dinner, with a violent fit of coughing: he left the table, went into another room, and expectorated about two quarts of pus. From this time his cough and purulent expectoration continued, being more severe at intervals of a week, when the chest emptied itself of about the same quantity as at first.

I was requested to see him in the country, in October. He was then pale and emaciated; his skin hot, and pulse one hundred and twenty. His appetite was good, and he took the same amount of food as in health; but his system was gradually giving way under the disease. He was very desirous of having an opening made into his chest, the idea being original with him, and not derived from others.

On examination of the chest, it was observed that the right side was enlarged, and that the lower intercostal spaces were rather protruded than depressed. There was no decided prominence or pointing at any particular spot. On percussion, the

right side was quite flat, except for one or two inches below the clavicle, where a subcrepitant râle was noticed. Succussion caused a loud, swashing sound, which was heard by the patient himself, and had probably brought to his mind the idea of relief from a puncture. The respiration on the left side was decidedly puerile.

The chest was punctured with a delicate trocar, about four inches from the spine, between the ninth and tenth ribs; and, Guerin's syringe being applied, a pint and a half of thick, healthy, inodorous pus was withdrawn. No cough or constitutional disturbance followed. Great relief in breathing was at once perceptible; and he arose, and walked about the room in high spirits. The lung expanded, and respiration could be heard along the spine, and for one or two inches below the scapula, also much lower down than before in the front part of the chest.

Nov. 4th, this patient was so much better as to be able to make a visit to Boston. His cough was now less; he had gained flesh, and his strength was increasing. The respiratory murmur could be distinguished all along the spine, quite clear, and free from crepitus. The side was flat on percussion, and the respiration and sounds of heart heard as if at a distance. Nov. 15th, finding that the pus was again collecting, the chest was punctured, and twelve ounces of fluid drawn off with relief. As the pus continued to collect, and the symptoms to recur, there seemed but little probability of a cure without having recourse to a permanent opening. It was therefore decided to introduce a large trocar, and leave the canula in the wound. To facilitate its introduction, as it was feared the thickened pleura and false membranes might resist, an incision was first made through the integument, and the trocar then pushed in forcibly. What had been feared as a possible occurrence happened, — the instrument did not penetrate the cavity of the chest, and nothing but a few drops of blood issued. It was thought best to delay a repetition of the puncture for a few days, and watch the symptoms. A slight irritation took place in the wound, and the cough subsided. After a week, he proposed to return home, and, if necessary, make another visit to town, and have the operation repeated.

He was not heard from again until Jan. 9th, 1854, when I was called to see him in the country, and found him laboring under very alarming symptoms. He was confined to his bed in an extreme degree of emaciation; pulse one hundred and fifty, skin clammy. The expectoration was profuse, and so offensive as to make it difficult to remain in the same room with him. He said that, on his return from Boston, the weather being very bleak, he was much exposed, and took a severe cold; from which time the symptoms had all been unfavorable. The expectoration was so nauseous as entirely to destroy his appetite, and the cough was constant and painful. His vital powers were so reduced that some hesitation was felt in attempting any operation; but the patient was so urgent that it should be tried, and it being the only chance for life, it was resolved upon. The fine trocar was used as at first, and two quarts four ounces of fetid pus were drawn off, with immediate relief. The air passed freely in and out of the canula during respiration. He was directed to keep the aperture in the canula closed with a cork, which was to be removed twice daily, and the pus evacuated. The patient from this time, under the judicious management of his physician, gradually recovered; and, in May, he was able to present himself in Boston in good health. I saw him in November, quite stout and healthy; and he had no cough nor expectoration. He employed himself in his trade of watch-making. The lower part of the right side of the chest was flat: there was no contraction of that side. Respiration was heard below the scapula, without crepitus. I was assisted in the above case by the able advice of Dr. Bowditch, and in the last operation by Dr. Slade.

CASE LXXXIV. — *Pleurisy. Empyema. Pus drawn off by a Puncture in Back. Afterwards Pointing, and an Opening made in Front. Hemorrhage, at the end of two years and a half, from the Anterior Opening. Free Incision. Cure.* — A gentleman, aged 45, had an attack of pleurisy on the left side. Pus formed there, and was drawn off by a puncture in the back, with a fine trocar and canula, and great relief afforded. Subsequently, there was pointing in the front of the chest; an

opening was made with a lancet, and the pus evacuated. The patient recovered his health; but a purulent discharge continued to flow from the aperture made by the lancet. A few weeks before I saw him, a sudden discharge of blood took place from this opening, and, recurring once or twice, reduced his strength, and incapacitated him for business. At this period, the pus escaped through two openings in the integuments by a tortuous route. With a probe, the rib, in a carious state, could be detected. It was thought probable, on consultation, either that from the pus being retained in the chest on account of the small size or irregularity of the openings, or from the diseased rib, a source of irritation existed which gave rise to the hemorrhage. With this idea, it was decided to dilate the external openings by means of prepared sponge. This was found to be a matter of some difficulty, on account of the great irritability of the wound, and could be done but imperfectly; still the patient received a temporary relief from it. The hemorrhage, however, was shortly repeated, was more severe than at first, accompanied by the appearance of purpura over the whole body, and brought him into an alarming state of prostration. It was now clear that something decided must be done, or the patient would sink; and, on further consultation, it was agreed that the rib should be cut down upon, the carious part removed, and, if thought expedient by the knowledge thus acquired, a free opening made into the chest. The patient being etherized, a somewhat laborious dissection was required to expose the rib, on account of the accumulation of lymph over it, which had gradually collected, and obscured the opening into the chest. About an inch of the bone, in a diseased state, was excised, and the pleura, much thickened by inflammation, exposed. An aperture about an inch long, with thickened edges, was now seen, which, being enlarged laterally, allowed the forefinger to pass freely into the cavity of the thorax. It was ascertained that the interior of the pleura was lined with a highly vascular spongy tissue, bleeding on the slightest touch, which, probably being irritated by the retained pus, had given rise to the profuse hemorrhage. Being turned on his side, a large quantity of blood and pus ran out.

From the time of the operation, he began to improve, and with the exception of a very slight discharge of blood from the chest, on the day succeeding, had no farther difficulty. He is now, many years after, in good health. His chest is contracted on that side, and his shoulder greatly depressed; otherwise he has the appearance of a very strong and healthy man.

In another case (that of a boy about 16 years of age, referred to me by Dr. Bowditch), where severe cough, emaciation, and other disagreeable symptoms, were dependent on empyema with an imperfect escape of pus through fistulous openings, all symptoms were relieved by making a free and direct opening into the chest.

The last two cases are selected from quite a number which have occurred to me. As a general rule, I would repeat what I have before said, that a free incision, with the removal even of a piece of the rib if necessary, gives the best results where repeated punctures have failed.

In regard to the excision of a portion of the rib for tumors or other disease, generally speaking, the danger is less of penetrating the pleura than will at first be supposed. The texture is so thickened by inflammation as to be easily peeled from the bone.

CHAPTER V.

ABDOMEN.

HERNIA. — STRANGULATED HERNIA.

THE whole treatment of strangulated hernia has been altered by the introduction and use of ether. Many cases which resisted the use of ice, depletion, and debilitating remedies, such as antimony and tobacco injections, are now, with the patient well etherized, and careful manipulations, reduced without a cutting operation. I have seldom had any difficulty in reducing hernias of large size: it is the very small hernial tumors that occur suddenly after an effort, in which the taxis under ether often fails. After a moderate and careful use of the taxis, I have never delayed the operation, and have availed myself of the patient's being under the influence of the anæsthetic to proceed at once to it. In skilful hands this is almost always successful; and I have never had reason to believe that the patient died from the effects of the operation, it almost always being from the delay in performing it. Some cases of large hernia have been under my care at the Hospital, which at first appeared in a strangulated condition, but which were simply impacted from a sudden addition to an already pretty firm tumor. If the symptoms were not urgent, rest in a horizontal position, a starving diet, opiates to relieve pain, and, in some cases, compression, have, after a few days, succeeded in affording relief.

In one case of a very small strangulated hernia, in which the symptoms were very urgent, and where death seemed imminent, I advised an immediate operation; but the patient positively declined, preferring to die as she was. A week afterwards, to my surprise, I was called to her again by her physician, and found her still alive, and ready to have the operation done. On open-

ing the tumor, the sac was found entirely gangrenous ; but the pressure of the stricture had been expended on this part, and the small loop of the intestine, though very much discolored, still preserved its vitality. The stricture was divided, and the intestine returned. The patient recovered. This case, however, is a very rare one. The rule should be, where the hernia is not at once reduced under the relaxing effects of ether, not to delay the operation with the idea that the tumor may be removed by local applications.

The distinguished surgeon, Mr. William Lawrence, of London, whose treatise on Hernia still remains the best authority, — as do all his works on scientific subjects, — says, "The danger to which the patient is exposed by the operation is less than that which he undergoes by delay. In the latter case, inflammation and gangrene of the part, which is thus rendered incapable of exercising its functions, and extension of inflammatory disorder along the canal above the stricture, as well as over the cavity of the abdomen, with rapid exhaustion of the vital powers, are surely produced by a continuance of the incarceration." And again he says : "Our conduct must not be guided merely by the duration of the case : the kind of strangulation, the nature of the symptoms, the effect of the means employed, and the state of the parts, must influence our determination. Small and recent herniæ, or such as, having been kept up for a long time by means of a truss, are suddenly reproduced, admit of little delay. The strangulation is violent in such instances ; inflammation and gangrene soon come on. In old and large ruptures, which have been often down and often replaced, the symptoms are not so urgent, nor the necessity of operating so pressing."

I propose to adduce a few cases in illustration.

CASE LXXXV.—*Strangulated Femoral Hernia. Omentum forming a Cyst containing the Intestine. Large Abscess within the Abdomen.* — The subject of this case was a laborer, 40 years old. The hernia first made its appearance five years before, in 1837, and was discovered filling the scrotum after a hard day's work. The patient was able to return it himself with

some little difficulty: he made no application, however, and wore no truss; and when the intestine was occasionally protruded and a little pinched, by quiet and abstinence, he succeeded in replacing it without medical assistance. Two years before, the hernia suddenly disappeared, and did not appear again until the time I was called to him, in 1842.

I was requested to see him by his physician, Dr. Brown, under the following circumstances. Forty-eight hours before, while raising a heavy load, the hernia was again suddenly forced out, and severe pain in the abdomen immediately ensued. He made repeated efforts to reduce it, and the following day even attempted to resume his work, but fainted from pain, and was taken home. He did not see his physician until the next morning, not apparently being aware of the dangerous nature of the disease. He was immediately bled, ice was applied to the hernial tumor, and all the ordinary means for the taxis resorted to. In the afternoon, the symptoms becoming aggravated, I was requested by Dr. Brown to perform the operation.

The tumor at this time was about the size of an orange, very tense and painful to the touch; and the scrotum, from the long-continued efforts of the patient by severe rubbing for its reduction, had become considerably inflamed. He complained of a severe dragging and almost insupportable pain in the abdomen. On opening the hernial sac, a large mass of omentum presented, very red and swollen: this had an elastic feeling, as if it surrounded a mass of intestine.

The stricture, which was formed by the external abdominal ring, was extremely close; and it was with the utmost difficulty I was able to insinuate a director under its edge, and divide its fibres. This being accomplished, the strangulated parts were a little loosened so as to allow me, after some examination, to insert the little finger into an aperture formed by a folding of the omentum, and discover a knuckle of the intestine, which was thus almost completely encysted. By a slight pressure, this was easily returned into the abdomen. The reduction of the omentum was, however, a matter of more difficulty; and it was only after a further division of the stricture, and by considerable management, that it was ultimately reduced. The omentum,

though much swollen, was not at all indurated, and was otherwise quite healthy. He expressed himself immediately relieved on the completion of the operation.

The following morning he was free from pain in the bowels, which acted well after a dose of castor oil. There was a retention of urine, which required the use of the catheter. His pulse was a little accelerated. On the third day, I perceived a slight redness in the groin, and he complained of a deep-seated pain in the left iliac region. The pulse was quick, countenance anxious, and the tongue considerably coated. On the following day, the redness had extended itself nearly half down the thigh, and over a part of the abdomen of the same side. There was great pain at this point, on pressure; but the abdomen generally was not over-sensitive, and presented no appearance of extended peritoneal inflammation. His bowels were freely evacuated by means of castor oil, and leeches were applied to the seat of pain, followed by a large poultice to promote the flow of blood, and increase the capillary circulation. In the course of a few days, an indistinct fluctuation could be distinguished deep in the iliac region, which finally, ten days after the operation, began to discharge itself through the external abdominal ring at the upper part of the wound made in the operation. So far as could be ascertained, about a quart of pus was contained in the abscess. The parietes gradually contracted, and the patient recovered without further difficulty.

The three points of interest in this case are, first, the disappearance of a large hernial tumor, which for three years had been unrestrained by a truss, and its sudden return, and immediate strangulation by the external ring, two years afterwards. Second, The encysted state of the intestine, which was so completely concealed, on the first opening of the sac, that it could not be exposed; for it was only after the protruded parts had been relieved by a free division of the stricture, that the omentum could be unfolded, and the intestine discovered through a small aperture at its posterior portion. Third, the formation of the large abscess within the abdomen. No appearances were presented, on the evacuation of this abscess through the abdominal ring, to justify the idea that any portion of the omentum had

become gangrenous : the pus was well formed, and in all probability must have been derived from a suppuration of the prolapsed omentum, which had been inflamed partly by the strangulation it had been subjected to, and partly from the long-continued and violent efforts of the patient to force it back into the abdomen.

CASE LXXXVI. — *Strangulated Hernia. Reduction under Singular Circumstances.* — To the above case I may add one of some interest, showing the powerful influence of fear in effecting the reduction of an apparently irreducible hernia, which had resisted all the ordinary means of treatment. I was requested by a medical friend to perform the operation for a patient laboring under the most urgent and distressing symptoms I have ever witnessed in this disease. The hernia was an old one, and had first become strangulated two days before. In addition to severe pain in the abdomen, the patient had violent spasmodic action of the whole body, especially of the lower extremities, and an almost continued vomiting. Before I saw him, he had been thoroughly bled to syncope, ice had been applied to the tumor, and a tobacco enema had been administered, but all without effect ; and the only hopes of saving life appeared to be in the speedy resort to surgical means. All the preparations for the operation being made, as I was just on the point of commencing the incision, his courage gave way, and he obstinately determined not to submit to it.

I then stated to him the great danger of any delay, and the probability of a very speedy fatal termination if the intestine was allowed to remain longer in its present situation. The danger of death before his eyes seemed to have a powerful effect on him ; and, while I was speaking, the spasmodic action of the body ceased, and the patient became deadly pale. Having my hand on the tumor, I felt a slight relaxation in its contents. I immediately seized the intestine through the abdominal parietes with one hand, and, making a strong extension, used a slight compression with the other hand, on the sac ; and the hernia slipped back into the abdomen. His recovery was complete.

Had it not been for the occurrence of the accidental circum-

stance mentioned above, I have every reason to believe that the mere intensity of suffering must have shortly terminated his existence.

CASE LXXXVII.—*Strangulated Hernia. Stercoraceous Vomiting. Introduction of Fecal Matters into Air Passages. Death.*—On Sunday, July 6, 1862, a woman, 43 years of age, was brought into the Hospital for strangulated hernia of five days' duration. She had suffered with an inguinal hernia on the right side for four years. It was reducible, and she wore a truss.

A week before her admission to the Hospital, after violent straining, the hernia came down, and could not be reduced. Constant vomiting commenced, which, for three days before her entrance, was stercoraceous. When she entered, she was in the greatest state of prostration, countenance pale and livid, and very apathetic. She answered questions reluctantly, and only when strongly pressed. Stimulants were first administered to her. After some re-action had taken place, ether was given sparingly; and she came easily under its influence. The operation was performed with great rapidity, only occupying a few minutes. Some serum was found in the sac, and the intestine much congested. The stricture was divided, and the intestine was replaced. The ether was discontinued at about the middle of the operation.

The edges of the wound were then brought in apposition, the patient breathing tranquilly, and the usual preparations made to return her to her bed in the ward. Suddenly the patient (who had made the usual groans and sighs of a person recovering from ether) made an effort to vomit, and was placed on her side to facilitate the escape of the fluids from her mouth. These efforts were once or twice repeated, when the face became livid, pulse began to fail, and a loud subcrepitant râle could be heard all over the chest; the symptoms resembling those of a person asphyxiated by drowning. All the usual remedies were employed to restore the vital powers; but the pulse and respiration gradually failed, and she died in the course of ten or fifteen minutes.

On examination of the body, the following day, the appearances presented were these : —

The intestines and stomach were entirely filled with a large quantity of yellow fluid of a very fetid odor. The mouth and fauces were also filled with a similar fluid. On opening the air-passages, this same fluid was found to have penetrated the most remote ramifications of the bronchiæ.

The incarcerated intestine, which had been freed by the operation, showed the marks of the great constriction to which it had been subjected, but would probably have recovered itself.

At first sight, I thought I had met with a case of death from the use of ether; but the autopsy revealed the nature of the case.

The patient, as has been stated, had partially recovered from etherization, so as to make articular sounds. The medical gentlemen who were present at the operation had, in fact, most of them retired, thinking the case finished. From the recurrence of the efforts to vomit, partly from the great reduction of the vital powers, in connection with the insensibility of the glottis from the effects of ether, the fluids had gained a ready entrance into the air passages.

The following case from the "London Medical Gazette," to which my attention has been called by my friend, Dr. Francis Minot, is interesting as illustrative of a similar occurrence, though of a different origin. As the case is instructive, I transcribe it.

"St. Thomas's Hospital, April 23, 1859.—The following case illustrates some of the ill effects of drunkenness, and shows the impropriety of leaving persons in this condition wholly uncared for :—

"J. W., a laborer, 32 years of age, was brought to the Hospital by the police at 7 o'clock, A.M. He had, some little time previously, been taken to the station-house in a state of complete and helpless intoxication; had remained there a few hours without having much attention bestowed on him; and, at the end of that time, his condition then exciting some alarm, he was brought to the Hospital.

"On admission, he was found still to be somewhat comatose ; but his face was livid, his breathing laborious and wheezing, his pulse almost imperceptible and rapid, his skin moist. He presented, in fact, most of the features which characterize the last stage of bronchitis. He died in the course of a few hours.

"*Autopsy.* — Body in good condition, but anasarcaous. The superficial veins of the brain were more loaded with blood than usual, and the substance of the organ was somewhat congested. Pericardium and heart healthy ; the cavities of the latter were dilated, and filled with soft black coagula ; pleura free from adhesions.

"*Lungs.* — Large, much inflated, but not emphysematous : they were crepitant throughout, and a little congested ; but there was no œdema. On squeezing the sectional surface of any part of either organ, all the cut bronchial tubes yielded tenacious cylinders of a dirty yellowish hue ; and, on tracing the tubes, it was found, that all of them, from the largest trunks to the minutest ramifications, were filled almost completely by a material in some places softer, in some more tenacious, but everywhere, in all essential particulars, resembling that squeezed from the cut orifices. The mucous membrane of the tubes was deeply congested throughout, and in some instances it appeared as though small extravasations of blood occupied the submucous tissue. The mucous lining of the larynx and trachea was likewise intensely congested ; but it was not thickened, and there was no exudation on the surface. Under the microscope, the material occupying the bronchial tubes was found to present a large quantity of free oil, cells of potato, and innumerable fragments of muscular fibre, together with a good deal of stuff of which the nature was not clear ; the whole being intermixed with ciliary epithelium, and some imperfect forms of cells belonging to the mucus, which cemented, as it were, the various substances into the form of tenacious cylinders.

"Peritoneum healthy. Liver, of uniform, reddish-brown hue, congested, but healthy. Spleen, of usual size, pale, flabby, and wrinkled. Pancreas, kidneys, and supra-renal capsules, healthy.

"The mucous membrane of the stomach (cardiac end) was

somewhat congested and softened; but that of the rest of the organ and of the intestine was healthy, presenting, however, a more than ordinary quantity of mucus adhering to it. Aorta healthy.

"*Remarks.* — It is evident, from the results of the examination, that the man, while in his drunken state, had been continually vomiting, or, rather, regurgitating the contents of his stomach; and that, owing to his unconscious and perhaps partially paralyzed condition, he had drawn these continually through the larynx, and thence into the bronchial tubes, which had gradually become choked up. It is clear, too, that the irritation of the foreign matter had excited in the latter intense congestion, and copious effusion of mucus; and that, from the combined effects of the abundant accumulation of vomited material, of congestion, and of effusion, the patient had been suffocated, and had developed those symptoms which had simulated bronchitis.

"From the complete way in which even the smallest bronchial tubes were filled, from the history, imperfect though it be, and from other circumstances, it is obvious that the process had been a gradual one: and one cannot help regretting, therefore, that he had not before been placed under competent supervision; and that such precautionary measures, and such treatment as would have suggested themselves to any medical practitioner, had not been put in force at an early period."

CASE LXXXVIII. — *Case resembling Strangulated Hernia. Difficult Diagnosis.* — A girl, aged 23, entered the Hospital, in the medical wards, June 23, 1866; and, on the following day, was referred to me by the physician, under the supposition that she had strangulated hernia. She said that, seven weeks ago, from a strain, she felt a pain in both groins. Five weeks ago, while lifting a washtub, a tumor appeared suddenly in each groin, which had been painful since. For the last week or two, she had been confined to her bed, with much pain in the right tumor; had had no movement of the bowels for six days, in spite of the use of medicines; and had been troubled with vomiting.

The right tumor was so painful that she could not support

any examination without ether. This being given, a slightly inflamed elastic tumor, the size of a hen's egg, was found, just below Poupart's ligament, on the right side, and a smaller one on the left. It was decided, on consultation, that though it was improbable that two hernias should appear at once, yet, as there had been vomiting and obstinate constipation, there was reason to believe that the bowel might be in the tumor, and delay might be fatal. It was therefore agreed to make an exploratory operation, as, in case it turned out to be a suppurating, glandular tumor, this would afford relief.

The right tumor was, therefore, cut down upon ; and, the fascia covering it being exposed, there was a dark appearance under it, like the sac of a hernia. This being cut into, pus escaped, and the tumor was found to be glandular. A similar operation was done on the other side.

On recovering from the ether, she expressed herself greatly relieved, the pain previously being almost insufferable.

On the following day, there had been a slight evacuation from an enema ; but no further evacuation, notwithstanding a dose of senna. The senna being repeated, at stated intervals, on the second day after the operation, and the seventh of the constipation, the bowels were finally acted upon. After this, she began to recover.

In connection with this case, I would mention the following :—

I was requested to see a patient, in the spring of 1866, who had had, periodically, for a number of years, a tumor appear in the right groin, attended with severe disturbance of the digestive organs, with constipation. This had recurred, as usual, and the symptoms had been treated without relief.

On examination, I detected a hernial tumor in an inflamed condition, which was at once cut down upon, and the sac and the intestine found gangrenous. The upper and lower openings of the intestine were about large enough to admit a small-sized bougie, their parietes being greatly thickened.

The patient died about three days afterwards ; it being impossible to get any evacuation, though injections were thrown into the upper opening.

At the autopsy, the upper intestine was found flatly applied

to the edges of the right femoral ring, so as, together with the inflammatory condition of the intestine, to prevent any passage of the contents. In the same side of the uterus was found a fibrous tumor the size of an orange, which, by the enlargement of that organ at the catamenial periods, might possibly explain the periodical forcing down of the rupture.

Many years since, when a student, I assisted Dr. John C. Warren in an operation on a lady who had been treated by a physician for bilious colic for a number of days, when a small tumor in the groin was detected.

On Dr. Warren's being called, he found what appeared to be an enlarged gland there. As the symptoms were urgent, an operation was done. The gland was exposed, and dissected up. Under it was discovered the end of a knuckle of intestine, in a dark state, just projecting from the femoral ring.

The constriction was relieved, and the intestine returned ; but the patient died.

I have met myself with a similar small strangulated hernia, concealed by an enlarged gland ; but fortunately got the case in time to save the patient. As a point of practice, therefore, it would seem proper, where the symptoms of strangulated hernia are present, to explore, although the nature of the tumor may be doubtful.

CASE LXXXIX. — *Strangulated Hernia, with Unusual Appearances.*—April 30, 1865, a woman, 27 years of age, entered the Hospital, with a strangulated inguinal hernia of the right side, of two days' duration. She had been troubled with a small reducible hernia some years, which had been forced down, and less easily retained for the last fortnight. She now had intense pain, vomiting, and all the symptoms of strangulation.

On opening the sac, a little bloody fluid escaped, and what seemed to be the red and swollen intestine presented. No probe, however, could be made to penetrate around its margin into the ring. I requested my colleague, Dr. Clark, to examine it ; and he finally discovered a small aperture at the inner side of the tumor, where a probe penetrated. Here I incised the

tendon ; and, after much manipulation, the intestine was reduced, and a large quantity of sero-sanguineous matter escaped from the abdominal cavity. What the obstacle was in this case, I am unable to decide. The most probable explanation is, that the intestine had pushed before it a very thin layer of omentum, which was firmly adherent to it, and also to the margin of the sac, with the exception of the small opening where the probe penetrated.

The patient had a good recovery.

CASE XC. — *Strangulated Hernia in a Child one year old.*— A child was brought into the Hospital, March 20, 1863, with a hard tumor in the upper part of the left side of the scrotum. There had been great suffering for twenty-four hours, constant vomiting, and complete retention of urine. The mother said that, ever since birth, the child had had a tumor, sometimes on one side of the scrotum, and sometimes on the other. It had, however, never before been hard, nor had it at any time given rise to any inconvenience. Latterly she had observed a tumor only on the left side, where it now appears. Dr. Blake, formerly house-surgeon at the Hospital, saw the case, and, suspecting its nature, sent it into the house. The child seemed to be in great pain, and strenuously resisted any examination. The tumor was very tense, globular, and had the appearance of a hydrocele of the spermatic cord. When placed in strong sunlight, however, it was not at all translucent. On pressure, it was quite unyielding. In order the better to investigate the case, the child was placed under the influence of ether. The tumor, being seized by the fingers and thumb of the right hand, was firmly compressed. The left hand, being placed at the root of the tumor, made a traction so as to work the intestines through the neck of the sack, in the case of its being a hernia. It was soon found that the tumor gradually became softer under the pressure exerted, and half of it disappeared, leaving still a hard lump in the groin. The pressure being continued, the remaining portion suddenly retreated into the abdomen. It might have been stated, that an effort at reduction had been made before the administration of the ether, but without producing the slight-

est effect ; and a surgical operation would undoubtedly have been required by the urgency of the symptoms, had it not been for the assistance afforded by the use of ether. This is the earliest age at which I have ever seen strangulation occur in a hernia.

RADICAL CURE OF HERNIA.—Within the last twenty years, operations for the *radical cure of hernia* have attracted considerable attention ; and for a disease so common, so inconvenient, and in some cases so dangerous, it is remarkable that no safe and effectual operation has yet been discovered for its relief. In 1852, Dr. George Hayward, Dr. S. Parkman, and myself, were appointed a Committee of the American Medical Association to prepare a report on this subject. In that paper, I mentioned a number of cases of small herniæ which had been treated with success by the injection of stimulating liquids in the neighborhood of the neck of the sac, in the manner practised by the distinguished Professor Pancoast of Philadelphia. In some of these cases, as I have since been able to convince myself, the cure was permanent. Since then, many different methods have been proposed, some of which I have tried with success. The one most in favor at the present moment is that by Mr. John Wood, of King's-College Hospital, London, which has been frequently performed in this city. It consists, essentially, in the constriction and partial obliteration of the inguinal canal by means of a subcutaneous suture or ligature.

The method proposed by Dr. Pancoast, referred to above, may be described as follows :—

The contents of the hernial sac being returned into the abdomen, and the ring explored to ascertain that no portion of the intestine protrudes, the pad of a well-fitting truss is slipped down so as to make pressure on the inguinal canal, and prevent any escape of the hernia. With the forefinger of the left hand, the spermatic cord, as it passes out from the external inguinal opening, is pressed upwards on the pelvic bone, so as to prevent it from being injured. A delicate trocar and canula, the latter having fitted to it a small Anel's syringe, is now carefully but firmly forced through the integuments with a rotatory motion to facilitate its progress, and pushed forwards till it enters the ex-

ternal inguinal ring, or neck of the sac. The trocar being now withdrawn, the canula is kept firmly in place, and twenty or thirty drops of the tincture of iodine, tincture of cantharides, or sulphuric ether, thrown in, and lodged in the neck of the sac, when this is practicable, or else in the vicinity of the external abdominal ring. Subsequently, a small compress is applied over the minute wound made by the trocar, the pad of the truss slipped down over it, and the patient directed, for a week or two, to maintain the recumbent position.

In addition to the injection, in some of the operations, a tenotomy knife was previously introduced, and the internal surface of the neck of the sac scarified. The wound made by the knife in these cases much facilitated the subsequent introduction of the trocar, which is with some difficulty worked through the integuments. In no instance did any bad result follow, the pain and inconvenience hardly amounting to that presented in a case of hydrocele treated by injection, or in any simple operation.

The following case, attended with success, will serve as an illustration of the course generally pursued:—

CASE XCI. — *Radical Cure of Congenital Inguinal Hernia.* — A male child 3 years of age, with congenital inguinal hernia of the right side, was brought to the Hospital to obtain relief, if it was possible, as no truss had been found to retain the protruded intestine in the abdomen, and the pain and inconvenience from the infirmity were great. A tumor, the size of a small orange, was found to occupy the scrotum. By a little manipulation, the contents were ascertained to be a portion of omentum, a loop of intestine, and the testicle,—the whole of which, by care, could be easily returned into the abdomen.

The question was, whether the testicle could be separated from the other parts (the adhesions being quite intimate between them) so as to admit the return of the intestine and omentum into the abdomen, leaving the testicle in the scrotum. This being found possible, the operation was performed as follows: The intestine and omentum being returned into the abdomen, and the testicle prevented from following, the spermatic chord was held out of the way in the manner stated above. A sub-

cutaneous incision was then made with a cataract needle, the point of which was carried into the sac, and the neck scarified in different directions. Through the aperture thus made, a small trocar and canula were introduced: the former being withdrawn the syringe was adapted, and thirty drops of sulphuric ether were injected. The truss was then applied.

The operation was performed Oct. 28, 1847. There was every prospect of success until Dec. 9th, when, during a violent paroxysm of crying, the hernia was forced down. On the 12th, the hernia was returned, and the injection repeated. It resulted, on the following day, in a swelling of the scrotum, such as is observed after the injection for hydrocele. Dec. 22d, the report was made that the hernia came slightly down, and was returned with difficulty, "the aperture being apparently quite small." By the end of the month, it was stated that the hernia was perfectly retained. I have been informed since that the cure was permanent.

During the treatment of this case, a slight superficial supuration took place under the pad of the truss, which, the patient being somewhat fractious, was necessarily applied pretty firmly, to prevent the recurrence of the hernia after the operation.

In a large proportion of the other cases operated on, the patient experienced much relief, though still obliged to wear a truss. In one case, where the hernia was quite large, no relief was experienced. A female, with a double femoral hernia, on whom the scarification and injection were once or twice repeated, expressed herself much benefited by the operation; the hernia being retained, and the suffering previously experienced much relieved. Another patient, a laboring man, was seen by me six months after the operation: the rupture had not recurred, but he still wore a truss. Previous to this time, he had been unable to work without forcing down the intestine under the pad, causing him much pain and ill health.

From a comparatively limited experience, I derive the following conclusions:—

First, That the operation, when carefully performed, is safe.

Second, That, in ruptures where the neck of the sac is small,

and the abdominal aperture not too much enlarged by repeated descents of the hernia, there is a prospect of a radical cure.

Third, That, in most cases, the operation mitigates the infirmity, allowing the hernia to be more readily retained by the ordinary mechanical means.

Since the above operations, I have frequently performed that of Wützer, which consists of the invagination of the skin of the scrotum into the inguinal canal, and retaining it there by a proper instrument until adhesions have been formed. I have also done some operations by invaginating the skin, retaining it in place by means of a stitch, and applying caustic to the cul-de-sac, for the purpose of producing inflammation, adhesion, and a solid plug. Some of these cases have succeeded; others have failed, the hernia forcing itself down again behind the invaginated skin.

CASE XCII. — *Wützer's Operation for Cure.* — In June, 1860, a young man, 28 years of age, entered the Hospital for the purpose of having an operation performed to effect the radical cure of an inguinal hernia on the right side, which had existed for three years, and was as large as a hen's egg. He was placed upon the operating table: the hernia was reduced, and, after introducing a portion of the skin of the scrotum to form a plug, Wützer's instrument was applied, the needle passing through the invaginated scrotum, the hernial sac above the internal ring, and the abdominal parietes, and secured by a clamp.

On the second day, there was slight inflammation around the needle; and on the fifth day, when the needle was removed, pus appeared in the wound. On the eleventh day, lymph was discernible along the course of the spermatic cord, which after five days formed a firm plug, sufficient to confine the intestine in the abdominal cavity, excepting upon violent exertion.

CASE XCIII. — *Wützer's Operation for Cure.* — Soon after the above operation was performed, a boy five and a half years old was brought to the Hospital on account of a congenital inguinal hernia on the right side, which formed a tumor

descending nearly to the knees. It was easily reduced. He was etherized, and Wützer's instrument was applied, as in the previous case. The needle caused sufficient irritation to give rise to ulceration, by which a passage was made allowing it to slip down about three-quarters of an inch. On the seventh day, an effusion of lymph had occurred along the track of the spermatic cord; but, two days later, the hernial protrusion was noticed behind the plug.

Subsequently he was again etherized, a fold of the scrotum was invaginated, and three ligatures were passed through it and the abdominal parietes, and secured by means of pieces of bougie. There was much inflammation and swelling; and, on the fifth day, the ligatures were removed. The result was in every way satisfactory.

ARTIFICIAL ANUS.

Artificial anus is an affection generally caused by the sloughing of the intestine in strangulated hernia, although occasionally the result of abscess and penetrating wounds. Sometimes a small portion only of the calibre of the intestine is destroyed, the bowel becoming attached to the parietes of the abdomen, and a fistulous opening is the result, usually amenable to the ordinary method of treatment. At other times, a whole loop of the bowel sloughs off, and both ends of the intestine unite to the abdominal walls, leaving an opening from which the feces are constantly discharged, only to be remedied by surgical means.

Cases of the latter character are of unusual occurrence; and the means for their strictly scientific treatment by surgical operation have not, until within a few years, been fully established. The one I intend to relate is, as far as I am aware, one of the first successfully operated upon after the method of Dupuytren in this part of the country.

A patient with this affliction is one that may fully claim the sympathies of those called upon to administer to and alleviate human suffering. Suspended, as it were, in the possession of his mental faculties, between life and death, he is destined, unless relieved, to drag out a miserable existence, an object of

disgust to himself and a burden to his friends, or to sink, worn out by pain and the emaciation produced by deficient nutrition. It is a source of great satisfaction, therefore, to the surgeon, if he can be the means of relieving so distressing a misfortune.

CASE XCIV. — *Artificial Anus from Strangulated Hernia. Fistulous Openings in the Thigh discharging Fecal Matter. Operation. Cure.* — The patient, of whose case I propose to give an account, was sent to me by Dr. Brown, of Nova Scotia, in June, 1847. She was thirty-four years old, the mother of six children, and, previous to the occurrence of the present accident, of good constitution. A small crural hernia had existed on the right side for an indefinite period of time.

Dr. Brown was called to her fourteen months before, and found her laboring under a strangulated hernia of forty-eight hours' duration. An operation was immediately performed; but, on opening the sac, the intestine was exposed in a gangrenous state. The stricture was therefore divided, and the intestine left in the wound. At the end of a week, the sphacelated portion separated, and the feces flowed freely through the opening. After some time, she partially regained her health, was able to sit up, and finally to work moderately, until the following September, when abscesses began to form in different parts of the thigh. From this period, she gradually lost her flesh, and declined in strength. Two of the abscesses were opened by the lancet; the others, on the under surface of the limb, opened and discharged spontaneously. Pus at first issued, followed by fecal matter; and great suffering attended the effusion of the latter into the soft parts. Until within a few weeks previous to her coming under my care, there were occasional fecal discharges per anum; but the greater proportion of matter was evacuated through the various fistulous openings.

She arrived in town in the early part of June, 1847, and entered the Hospital.

She was extremely weak and emaciated; the countenance pale, nearly exsanguineous, indicating the almost total failure of the assimilating process. From long confinement, she had become nervous and timorous, hardly allowing the slightest ex-

amination; and, on the day before her entrance, she was so completely homesick, that, notwithstanding the great trouble and expense undergone by her physician and friends to enable her to accomplish her journey to Boston, she insisted on returning home at once by the same vessel in which she came. After a day or two of consideration, however, and by a little persuasion, she was induced to change her mind.

The position of the patient was almost entirely on her back. The feces, in a very liquid state, were constantly running out through two openings in the groin, and three in the posterior part of the thigh. The right limb was drawn up almost to a right angle with the body, and the whole thigh much enlarged and hardened. The skin around the openings in the groin had a red, irritated look, was thickened almost to callosity, and excoriated. The openings were quite small, so as hardly to admit an instrument larger than a common director.

A nourishing diet was allowed, and great cleanliness of the wounds enjoined, with the more especial object of preventing the painful excoriations.

The situation of the intestine could not at first be determined, which added to the embarrassment of the case. In those of a similar nature which I had an opportunity of seeing abroad, under the care of Dupuytren, the intestine opened on the surface of the abdomen, by a large aperture; and there was no difficulty in exploring at once the end of the bowel, with the finger or by instruments. In the present instance, the fistulous openings ran in every direction: those in the groin were immediately in the neighborhood of the probable orifice of the artificial anus, allowing a probe to penetrate for its entire length.

I therefore determined to dilate the two latter openings, which was done very gradually, by sponge-tents, on account of the sensitiveness of the patient to any manipulations; and it required the persevering application of this method for a month, before the two ends of the intestine could be with certainty distinguished. This, however, was finally accomplished, and a gum-elastic bougie passed into the upper, and another into the lower, orifices of the intestine. The bougie first penetrated through a thick, callous mass of integument, then through the

muscular or tendinous covering of the abdomen, in all about an inch in depth, when the septum, or spur, as it has been called, which separates the two ends, was encountered, and with difficulty entered, being so closely applied to the parietes of the abdomen as to prevent the least passage of matter from the upper into the lower part of the bowel. There had not been, in fact, for two months, the slightest fecal discharge per anum. The intestinal ends seemed to lie parallel to each other, so that the bougies introduced for exploring made but a very slight angle. The patient still remained nervous, and quite feeble.

I directed that the sponge-tents should be continued; also that a pint of oatmeal gruel should be given, per anum, daily, for the purpose both of stimulating the intestinal coats to the performance of their natural functions, and with the object of enlarging the calibre of the bowel, which must have become much contracted from long disuse.

On the following day, I found that some scybala had come away with the enema; and, on the next day, the injected fluid made its appearance at the apertures in the groin.

In the course of a few days, the principal opening had become so dilated, that, by a steady and patiently applied force, I could insinuate the little finger quite down to the intestine. The septum could now be distinctly felt lying against the wall of the abdomen, and be hooked up so as to permit the end of the finger to be carried into the lower portion. Its sensation was that of a delicate membrane, like the coronary valves of the aorta, though somewhat more resisting. A director was now carried down, at the side of the finger, for the purpose of keeping the intestine open, a gum-elastic catheter passed in, and a quantity of warm water injected, to make sure that the lower orifice had been found. This water afterwards appeared, and was discharged per vias naturales.

The patient being well prepared, I determined to apply the enterotome, which was done July 12th. Having made sure of the lower opening by a director, as on the day previous, the male branch of Dupuytren's enterotome was carried into the lower intestine: the director was then withdrawn, and the female branch introduced with ease into the upper. The two parts of

the instrument now occupied nearly the whole calibre of the dilated passage leading to the gut. I found at once that it was impossible to lock them; for the jaws of the female portion would not allow of sufficient motion, at the hinge, to lock with the other part of the instrument. If the intestine had opened directly on the abdominal surface, there would have been no difficulty; but the locking of the forceps under the existing circumstances was impracticable.

I therefore withdrew the instrument, and had recourse to another, which has since proved much better than the enterotome of Dupuytren. This instrument was four and a half inches in length. Its handle was constructed with a screw-vice, and the joint with a movable pivot, as in that of Dupuytren: the blades, however, were different. In the place of one blade being received into a groove in the other, they were serrated, like the polypus forceps, for the space of three inches. The blades, being introduced in the manner already described, were locked without difficulty, and at once brought together as tightly as the screw would permit.

On the next day, I found her free from pain. She had complained a little for a few hours after the instrument had been put in place; but there was a question whether this might not have arisen from fear.

The fecal matters passed by the side of the instrument, and warm water was daily injected into the wound, to prevent any obstruction. She had also an enema daily, which kept the lower bowel in action.

On July 15th, three days after its application, the instrument came away. In the jaws of the forceps, and bearing the impress of the teeth, was a blackish slough, two inches and a half long, four lines wide, and about three thick. The finger, passed into the orifice, could distinguish an opening, corresponding in size to the slough, between the two ends of the intestine, the edges of which were greatly thickened and fleshy, imparting a sensation entirely unlike that of a few days previous.

This examination was conducted with the greatest delicacy, from fear of destroying the adhesions, which must have been, of course, at this early period, of the slightest kind.

In the afternoon, she had a small fecal discharge through the wound. She complained of no pain, and there was no tenderness of the abdomen.

On the following day, the 16th, she was quite comfortable, had had a free dejection per anum from an enema, more slimy in its character than usual. There had been no discharge from the wound since the day before. A gentle compression was made by means of a compress and bandage on the openings in the groin, and the orifices ordered to be touched daily with the nitrate of silver.

She improved in health, rapidly acquired her strength, and had no farther discharge at the artificial anus from the day of the separation of the instrument until she left the Hospital, at which time the openings in the groin had almost completely cicatrized.

On July 29th, being very eager to return home, she was discharged at her own request, but against my wishes, as I was anxious to watch the progress of the case to its very close.

From a desire to learn the final result of this case, I afterwards addressed a letter to Dr. Brown, of Horton, N.S., her physician, and received a reply bearing date May 5, 1848. In his answer, this gentleman informed me, that, immediately upon her return, she was greatly improved both in health and spirits, the feces had their natural exit, and every thing looked very promising. In a short time, however, owing to over-indulgence in the use of coarse, flatulent food, and the want of that general surveillance so necessary for this class of patients, fecal matters had again appeared at the old orifice, as well as at several places on the hip, some of which were fresh outlets. This was the condition of things in December, when Dr. Brown was summoned to a meeting of the legislature at Halifax.

"On my return in April," writes this gentleman, "about a week ago, I was quite taken by surprise to find our patient perfectly recovered, looking as plump and gay as ever, and busily employed about her house. Being in haste, and she being busy, I did not examine her; but she informed me, that all the ulcers, as well as the original outlet, were entirely healed, except one new one, and that had not discharged fecal matter for some

time, and was in fact nearly healed; that the hip had greatly decreased in size, and had assumed quite a natural appearance; that her bowels were entirely regular, and she could take any kind of food without the least inconvenience. She even said she had not enjoyed so good general health for several years previous to her misfortune as now."

On reviewing the above case, it will be perceived that it presented difficulties of a formidable character. In the first place, the extreme debility and emaciation of the patient, and her great mental depression, were obstacles almost as troublesome to contend with as the disease itself. Twice, after much labor had been expended, and some progress made in the preliminary treatment, she insisted on relinquishing it at once, and returning home; and, on the day when the instrument was to be applied, she declared that she was certain she must die the following night, and that it was quite useless to attempt the operation. These depressed turns generally passed off after a time, and then the patient was very urgent to have the treatment continued; but, for the moment, they were sufficiently discouraging to the surgeon.

The numerous fistulous openings, with the effusion of fecal matter into the groin and back part of the thigh, occasioned considerable embarrassment in pursuing the treatment for discovering the end of the intestine. Added to this, and caused by it, the thighs were flexed nearly to a right angle with the body, and were constantly in the way of the instruments used for exploring the artificial openings.

The instrument used, I conceive to possess great advantages over that of Dupuytren. In fact, it consisted of, or may be almost exactly represented by, a common pair of old-fashioned polypus forceps, with the branches detached, and united by a movable pivot, instead of a fixed joint; the handles perforated with a screw-vice, and the jaws serrated throughout. It is less clumsy than that of Dupuytren, causes more complete strangulation, and does its work in less than half the time. By an examination of the cases of this distinguished French surgeon, it will be found that the enterotome generally separated about the seventh or eighth day: in the present instance, it came away

on the third, yet no effusion or other evil consequence resulted, although the patient was as little provided with the materials for forming plastic lymph as can well be imagined.

In the relation of this case, we have only mentioned the course of treatment ordinarily pursued by Dupuytren, without alluding to the methods of Physick, Gross, and others, in this country or in Europe, who have done so much to advance this branch of surgery.

CASE XCV. — *Artificial Anus in an Infant. Fecal Discharge from the Navel. Prolapse of the Intestine. Operation. Death.* — A case of a similar kind to that narrated occurred to me in an infant, some years since; and, as it illustrates one of the accidents liable to take place at any moment in patients laboring under this unfortunate affection, namely, a prolapse of the end of the bowel, the details may be here given.

I was requested, by the medical attendant of the family, to see an infant eight months old, and received the following history from him. He was first called to it when three weeks old: the parents stated to him, that, for a few days after its birth, it was in much distress, and had no alvine evacuation until the cord separated, when an exudation took place at the navel, followed by much relief. Shortly after, a small red tumor appeared at this spot, from the central portion of which the fecal evacuations occurred: there was no discharge per anum. He directed them to make use of a compress and bandage over the tumor: and, under this treatment, the child began to have evacuations by the anus, to gain strength and flesh. I advised that this treatment should be persevered in.

About two months after, from a sudden exertion, two tumors protruded from the navel, attended with some constitutional symptoms, and an entire stoppage of the evacuations. I saw the patient two days afterwards, and at once recognized a prolapsus of both ends of the intestine. The tumors lay across the abdomen, one to the right side, the other to the left; one portion, which proved to be the lower, was dark-colored, and more contracted than the other. The second or upper part of the bowel was large, covered with mucus, and the vermicular motion

could be distinctly seen in it. An effort had already been made to reduce them into the abdomen, but without effect; and a proposition had been made by some physician, who had seen the case, to apply a ligature to the root. This was advised in doubt as to the exact nature of the affection; and, in fact, the parts were so changed that they were with difficulty distinguished as belonging to the intestinal canal.

The child being cold, its pulse small, and having every appearance of rapidly sinking, I declined, for the moment, any operation, but advised stimulants, and agreed, if it revived, to attempt an operation on the following day, for the purpose of returning the bowel.

On the next morning, the child having revived under the treatment suggested, the following operation was practised: A small neck or tunnel existed at the navel where the intestine protruded, being, in fact, the common everted orifice for the two openings of the bowel. An incision was made at this spot, being within the peritoneum, though protruded from the abdominal cavity. The two ends of the intestine, as they issued, were now seized with a blunt hook, and slight traction made on them. The inverted portion slowly began to recede; and, by continuing this manœuvre, at the same time using some external pressure on the tumor, it gradually returned into the interior of the abdomen. The neck of the tumor, where the incision was made, and which represented the tunnel-shaped portion, was retained outside, so as to prevent the effusion of fecal matters through it into the peritoneum. Immediately on the return of the bowel, free evacuations took place from the anus, with great apparent relief. The patient, however, did not rally, but sunk, and died on the next day.

An examination after death presented no peritoneal inflammation, or effusion; and no attempt seemed to have been made by nature to close the incision of the operation, showing the low state of the vital powers at the time it was done. The upper portion of the bowel which had been returned, looked comparatively healthy: the lower was quite dark-colored, and showed the effects of the partial strangulation; an invagination of its coats for about an inch also was discerned.

CASE XCVI. — *Artificial Anus from Injury. Operation. Cure.* — May, 1859. A man, aged 29, was thrown from a sleigh about two years since, and alighted on the sharp point of the rail of a fence, which penetrated the left side of the abdomen, in the iliac and inguinal regions, producing a wound four or five inches in length, allowing the intestines to escape. A physician being called, the contents of the abdomen were replaced, and the wound closed by sutures. Pretty severe abdominal symptoms supervened; and, at the end of a week, fecal matter began to issue from that portion of the wound near the anterior superior spinous process of the ilium. He was confined twelve weeks to his bed, after which he was able to get up and move about, though much reduced in strength. The fecal matter continued to discharge from the wound from that time until the present operation.

The patient was a large, powerful man, over six feet in height; and although he was able to do some work, yet his usefulness had been in a great measure impaired by the accident, and the infirmity consequent upon it. He entered the Hospital on May 6, 1859, to see if any thing could be done for his relief. I was encouraged by the success of a previous case to operate, the condition of things being as follows:—

On the left side of the pelvis, about an inch below its brim, and in the neighborhood of the anterior superior spinous process of the ilium, was a puckered aperture, about large enough to permit the entrance of the little finger, surrounded by a red, indurated margin. Extending from this, a little upwards and also downwards, to the pubes, was a long scar, which remained from his previous wound. A probe, being passed into the wound upwards, penetrated three or four inches freely, as if superficially, and under the integuments: it could be passed downwards in the same manner without obstruction. The impression given by this examination would lead one to suppose, that the fecal matters must have an exit under the integuments, and afterwards pass out by a fistulous passage. This supposition, however, proved subsequently to be incorrect. The fecal discharges took place from the artificial opening at irregular intervals, two or three times in the day, were beyond the control of the patient, and

were partly solid, partly liquid; their consistence depending pretty much on the character of the food made use of. In addition, he had a small operation, once or twice a day, from the natural passage; this being voluntary, indicated that the barrier between the two portions of the intestine was not complete. He did not suffer particularly from colic or indigestion.

The patient being etherized, the little finger was passed freely in an upward direction, into the artificial anus, and an incision made upwards of about an inch in length, towards the edge of the pelvis, which at once exposed the intestine, showing that the two ends came quite up to the external orifice. The septum between the two could now not only be readily seen, and taken between the fingers, but could even be drawn out externally. The finger was passed up into the upper portion of the intestine, and downwards into the lower, which seemed, so far as could thus be ascertained, to be the sigmoid flexure of the colon. The very superficial appearance presented by the probe, when passed in, was found to be due to the thinness of the integuments, occasioned by the injury. The septum being carefully examined, the enterotome of Dupuytren was applied, and screwed up to make a moderate amount of pressure. In order to maintain the instrument perfectly firm, as it was on the side, and not on the front, of the body, it was necessary to pad it with cotton-batting, and secure it by a bandage around the hips.

On recovering from the ether, he made no complaint of pain. He was put on a diet of water-gruel, passed a good night, and on the following day, May 11th, was quite free from pain. He was as well on the next day. On the 13th, I found that, during the night, he had complained of some pain in the right side of the abdomen, requiring the application of hot fomentations and an opiate. At the time of my visit, he was relieved. He passed wind, both through the natural and artificial anus. I stopped the drinking of cold water, in which he had been indulging freely without my consent.

On the 15th, he was doing well: two small pellets of fecal matter passed from the artificial opening on the night previous; wind was passed through both the natural and artificial passages; the pulse eighty-one.

On the 17th, I found the instrument had come away during the night without the knowledge of the patient, and discovered a small, thin, dried piece of intestine in its jaws, an inch and three-quarters in length, looking like a bit of parchment. He was entirely free from pain, and without any distention of the abdomen. The wound was dressed with a pledget of lint, and a bit of adhesive plaster was placed over it to produce a slight compression.

From this time, the fecal matters resumed their natural course. It was found, however, after a time, that an obstruction occurred in their passage, about a couple of inches below the aperture; and, on investigation, it was discovered that the intestine, at this spot, turned short on itself. A second operation was therefore done, of hooking up this second spur, pulling it up to the external aperture, and applying the enterotome. The result was the same as before; the instrument coming away on the third or fourth day, without having produced any constitutional symptoms.

The contents of the intestines, after this, took a natural course.

The following year, I did a plastic operation, for sliding a bit of skin over a fistulous opening which still remained, and through which, occasionally, there was a serous discharge. Since then, I have not heard from him.

ILIAC TUMOR.

In this connection may be mentioned some tumors in the right iliac region, which occasionally lead to abscess, and fistulous openings on the parietes of the abdomen. In one instance, a man who had been a tailor changed his vocation at a late period of life, and turned farmer. The stooping position in working was, after a time, followed by a pain and swelling in the right iliac region. Very severe symptoms followed; and, finally, abscesses broke in different directions over the abdomen, through which fecal matter was discharged. In this condition, a year or two afterwards, he entered the Hospital, completely disabled, and unable to use his right leg, partly from stiffness of the hip-joint, owing to the inflammatory action in the neighborhood.

After a series of operations, the various fistulæ were explored, dilated, and healed, with the exception of one leading to the intestine, which, so far as could be discovered from its very deep situation, on account of the lymph deposited over it, was the cœcum,—being nearly three inches from the surface of the abdomen. The fecal matter was now discharged through a single opening. By this means, the irritation in the integuments was relieved, and he partially recovered the use of his right leg. He went into the country to recover strength for the final operation, and died there suddenly a month or two afterwards, so far as I could ascertain, from some other affection.

Shortly afterwards, another patient applied to me in a similar condition, the abscess having been brought on by a similar change of life and exercise. Probably it was in some way connected with the iliac muscles. He was too emaciated and feeble to undergo any operation, and, in fact, declined any.

I removed for him, however, a cancer situated on the end of his tongue, by ligature, which had caused him much trouble, and prevented him from taking his food in comfort.

Not long since, I had under my care a lady—past the critical season of life—who was seized, Jan. 1st, with a sharp pain, with tenderness in the right iliac region, preceded by some days' uneasiness in that quarter. She was treated by rest, mild purgatives, and fomentations. She recovered in about a fortnight. Feb. 1st, four weeks from the first attack, she was again seized, more violently than before, after having taken a long walk, and been much exposed to a cold draught.

An elastic tumor appeared gradually, in the course of two or three weeks, filling the iliac region, and extending up to the ribs, and, laterally, to the median line. It was exquisitely painful, so that it was examined with difficulty; still, I detected a deep-seated fluctuation under the cœcum, and my diagnosis was an iliac abscess, resembling somewhat those described by obstetric writers as occurring in puerperal women. The abscess, however, which in these cases can generally be felt through the natural passages, and often breaks into one of them, could not be found in this case. At the end of about three weeks, after very serious symptoms, I detected a small, hard lump, deep in

the groin beneath Poupart's ligament, and on the outside of the great femoral vessels, and in immediate contact with them. This I cut down upon with great care; and, on opening it, a small stream of pus followed, which continued to flow freely two or three days. The symptoms were at once relieved. The convalescence was, of course, slow. She ultimately entirely recovered, with a better condition of health than before.

In another case, a lady, going down a steep hill covered with ice, slipped; and in trying to recover herself, the body was thrown violently backwards. A snap was felt, as though something had given away in both groins, more particularly the right. I did not see her until some weeks after the accident. She had been unable to walk, in the mean time, without great pain in the abdomen, and had much disturbance in the intestinal canal. A few days before I saw her, there was a great discharge of pus from the intestinal canal, attended with relief. I could not detect any swelling in the iliac region, although it was excessively tender on pressure. It was nearly a year before she was able to bear the motion of a carriage, without causing a recurrence of the symptoms in the abdominal and pelvic regions.

Dr. James Jackson, in his "Letters to a Young Physician," mentions a tumor occurring in the iliac region, which he calls "a painful tumor near the cœcum," by way of distinction, sometimes of an acute, and sometimes of a chronic character, which I have frequently seen, before and since his paper was published. A painful, elastic tumor, of greater or less size, is felt in the region of the cœcum, attended with fever, nausea, constipation, and a great feeling of distention. Relief is gained from cathartics, which, however, I have generally been sparing of, having trusted to rest, fomentations, and sometimes leeches. In one case, in which powerful purgatives had been tried for a week, without effect, the sufferings became dreadful, and introsusception was feared. I advised that the patient should be placed under the influence of opium, and means used to reduce local inflammation. This being effected, evacuations took place spontaneously, and the patient recovered. In one instance, I have seen the disease recur twice, with an interval of one or two years. The duration of treatment has usually been about two weeks.

This tumor is important, as it is often not detected by a physician unaccustomed to it; and I have seen a number of cases which have gone on a week or more before the cause of the symptoms was found out. With Dr. Jackson, I have never seen it suppurate, though it is difficult to say exactly how it differs from those that do. The principal distinction seems to be that it is more sluggish, and its confines more definite, than in those tumors of the iliac region which terminate in suppuration.

CHAPTER VI.

ANUS.

HEMORRHOIDS.

THE common operation for hemorrhoidal tumors, for the last thirty years, has been by ligature. Before that time, I have seen excision practised, but, I may say, almost always followed by troublesome, if not dangerous, hemorrhage. The ligature is safe and effectual. I have generally performed the operation as follows :—

The bowels are cleared the day before. On the same day, prior to the operation, no solid food should be taken. The patient being etherized, the tumors are extruded by the finger, and, one after the other, seized with hooked forceps, the base transfixed by a double ligature, and tied on each side with great force, and the ends cut off. The skin of the edges of the anus should not be impinged upon ; and, if this cannot be avoided, a groove should be made for the ligature with a knife. The tumors are then returned within the anus. The patient is kept very quiet in bed, avoiding opiates, if possible, and can almost always go for eight days without an action of the bowels, unless the stomach is disturbed by improper food. A mild cathartic may be then administered, though sometimes the bowels are freed spontaneously.

The swelling which takes place sometimes causes a retention of flatus, which gives a sensation of great pressure. This is relieved by the cautious introduction of a large gum-elastic catheter into the rectum. Retention of urine, requiring the use of the catheter for about three days,—and I have once seen it last eight,—is not an unfrequent occurrence. I have once or twice tried, successfully, the use of the *écraseur* ; but, in very extreme cases, should think, unless it was very carefully managed, that its use might be followed by hemorrhage.

CASE XCVII. — *Hemorrhoids. Operation. Cure.* — W. A., 42 years of age, a large, muscular man, had been troubled for seventeen years with external and internal hemorrhoids. He was habitually constipated, and frequently, during the previous seven years, had lost blood when the bowels were evacuated, so that his pulse was weak, and he exhibited an anæmic condition, and was unable to work. Sometimes the rectum was prolapsed to the extent of two or three inches.

On the 30th May, 1863, I operated. He was etherized; and five large, hemorrhoidal tumors were drawn down, transfixed by double ligatures, and tied at the base. Care was taken not to include any of the skin. Two large external hemorrhoids were also cut off. On the seventh day, the ligatures came away; and at the end of a fortnight the bowels were opened by castor oil and enema. On the 22d of June, an examination showed that the internal tumors were entirely removed: there was no pain, and no blood was passed at stool. Three more external piles were excised, which completed the cure. This is an extreme case; and I have seldom found it necessary to interfere with the external tumors, the removal of the internal ones generally sufficing for a cure.

CASE XCVIII. — *Hemorrhoids. Operation. Cure.* — A man aged 47 entered the Hospital, June 16, 1863, suffering with hemorrhoidal tumors, and much blanched from loss of blood. He had had an attack of bleeding from the rectum thirteen years before, and another attack seven years after. The last five years, he had had frequent attacks, lasting two or three days, the tumors and mucous membrane in the vicinity remaining in a prolapsed condition during the paroxysms.

On the 20th, an enema having been previously administered, three or four large tumors were dragged down with hooks, and included in ligatures; care being taken to avoid every thing but mucous membrane.

After the operation, he required an opiate. There was for a few days considerable difficulty in micturition. The bowels were kept quiet for seven or eight days, and were then emptied by means of a mild purgative.

He was shortly discharged, entirely cured.

CASE XCIX. — *Hemorrhoids. Operation. Cure.* — A woman, 27 years of age, entered the Hospital in March, 1866, in an anæmic state, and fainting, even in the supine position, from constant and profuse loss of blood from hemorrhoids of twelve years' standing, brought on by constipation of the bowels. She said that sometimes she had lost as much as half a pint or a pint of blood a day, for three months at a time; but this, doubtless, was an exaggeration.

Fearing to operate on her in her reduced condition, she was kept for about a week in a horizontal position in bed, a tannin injection administered daily, and nourishing food given in a concentrated form, so as not to excite action of the bowels. By this means, the hemorrhage was almost completely checked, and she rapidly gained strength enough to allow an operation. At the end of about ten days, four or five tumors were drawn down and tied in the way mentioned above.

Very little febrile action followed the operation, and the pain was relieved by the local application of ice. By this means, opiates were avoided and her appetite preserved, so that, at the end of three days, she was allowed to take animal food.

On the ninth day, having some nausea, a dose of oil was administered, bringing away a large evacuation, without blood.

For the first few days, there was some retention of urine, requiring the use of the catheter. She gradually recovered, the bowels being only allowed to act every third day. I saw her two months afterwards in good health and flesh, and with a fine color. She complained of some local irritation on making any extraordinary exertion, or standing for any length of time; which she was then, for the second time, cautioned against.

External hemorrhoids, as already stated, do not often require interference, generally disappearing with the removal of the internal affection. Where a troublesome exuberance of integuments is left, it may be safely excised. When external hemorrhoids become inflamed and painful, they are generally dependent on a derangement of the digestive organs. If this is rectified, the paroxysm passes by. When one of the tumors becomes strangulated, so as not to retain its position within

the anus, relief is almost at once obtained from a puncture, which gives issue to a clot of blood.

FISSURE OF THE ANUS.

It would be difficult to find any disease attended with such unmitigated suffering as this apparently trivial affection. The symptoms are as follows: pain as of the passage of a hot iron through the anus, combined with a sensation as of cutting with a knife, sometimes attendant on the act of defecation, at others coming on at an interval of a few minutes or half an hour afterwards; and lasting often for several hours with such severity as to confine the sufferer to his back, or even to his bed; this recurring day after day, and sometimes for months or years.

Generally a slight mucous, purulent, or bloody discharge is voided with the feces, giving the idea to the patient and his physician that he is laboring under fistula. With this impression, he often asks advice of the surgeon. On examination, by carefully pulling down and separating the folds of the anus, a small fissure, or crack, is discovered just within the margin, and extending inwards for an inch or more. If the disease is of long standing, an ulcerated surface, with elevated edges, takes the place of the fissure. The seat of the disease is often the centre of a hemorrhoidal tumor; and, so far as my observation goes, it occurs twice or three times as often in women as in men. In nine cases out of ten, I have found it on the coccygeal side of the anus, on the median line, scarcely ever on the sides. Sometimes two fissures are found, one behind and one in front. In regard to treatment, I have seldom seen it yield to the vaunted astringent injections of rhatany, &c., as used by the French, or to emollient or anodyne enemata. A number of times, when the disease was recent, I have found it yield to a thorough cauterization with a stick of nitrate of silver; but it seldom gives way under any treatment short of the use of the knife. The surgical operations which I have seen practised, many years ago, for the relief of this affection, were of a savage description; comprising not only the incision of the stricture, but a cut through the whole sphincter muscle, extending nearly, if not quite, to the coccyx. My

own practice has been as follows : to have the anus well dilated, and the mucous membrane drawn down so as fully to expose the diseased surface. If there was an ulcer of long standing, the anterior part of the ulcer was seized with forceps, and the whole disease carefully excised from without inwards, by means of scissors ; the wound, after its removal, making the centre of a portion of tissue, with a margin of healthy mucous membrane. In case there has been much spasmodic contraction of the sphincter, which, however, is almost always dependent on the great irritability of the fissure, I have sometimes made a subcutaneous division of that muscle. In other cases, by passing the forefinger into the rectum, and hooking it under the sphincter, a small opening is made into its sheath ; the muscular fibres are then exposed by bringing them out upon the finger, and divided. This plan I have also adopted with success, in operating in cases of rupture of the perinæum : its advantage is, that it avoids a large wound extending into the rectum, which may cause deep-seated hemorrhage, and allows the blood to escape externally, if there should be any tendency to bleeding after the division. I should have stated, in speaking of the treatment, that in one case in which there was great suffering, and violent contraction of the sphincter, this was relieved, and the fissure allowed to heal, by wearing a short metallic rectal bougie, of a dumb-bell shape, with an aperture in the centre for the escape of flatus.

CASE C. — *Fissure of the Anus.* — A man 35 years old, who had been subject to hemorrhoids for a year whenever he had an action of the bowels, was attacked with a most acute pain, not only during the passage of the feces, but for an hour or two afterwards. He had been under constant medical treatment, both local and general ; and, from the feces being occasionally streaked with blood and pus, it was supposed to be a case of fistula, although nothing of the kind had ever been discovered on examination. He was much worn down by suffering, and was entirely prevented from doing any business. On separating the nates forcibly, and making traction on each side of the anus, so as to pull down and expose the folds of the rec-

tum, I at once discovered the commencement of a fissure, just within the anus. The patient being made to brace himself up, the fissure was gradually forced down, and exposed to view throughout nearly its whole extent. Its whole surface was then thoroughly cauterized with the solid nitrate of silver, which application seemed like the touch of a red-hot iron. After the pain, which lasted for an hour or two, had subsided, a distinct relief was experienced. At the next evacuation, which occurred two days afterwards, there was absolutely no pain. Subsequently, in the course of a fortnight, there was a return of pain during defecation. A second application of the caustic completed the cure.

One or two other cases of this disease, which have come under my observation, in males, have been cured under a similar method of treatment.

CASE CI. — *Fissure of the Anus.* — A lady 35 years old, who had suffered severely from hemorrhoids during pregnancy, after her last confinement (which was two years before I saw her), began to have severe burning and lancinating pain after every operation from the bowels. Her sufferings gradually increased, until they became almost insupportable, and confined her to the bed during the greater part of the day, after each evacuation, which caused severe constitutional disturbance, such as chills and fever, with profuse sweating. Every kind of treatment had been tried, in the way of local applications, injections, and laxatives, together with occasional opiates, but without permanent benefit. As any examination with the finger was utterly insupportable, she was etherized, and preparation made for an operation if it should prove to be necessary. On separating the folds of the anus, a broad fissure was discovered, or rather ulcer, with depressed centre and elevated edges, which extended into the rectum for some distance. The anus was now drawn well open by two assistants, and the external portion of the ulcer firmly seized with toothed forceps, and a careful dissection made with pointed scissors; the ulcer being gradually dragged down as the dissection progressed. In this way, the entire diseased surface was thoroughly excised. After

the operation, no evacuation was permitted for a week: the first dejection was attended with some pain; but, as the wound healed, the pain became less, and a good recovery took place. It is now nearly nine years since the operation, and she has been entirely well since.

CASE CII. — *Fissure of the Anus.* — About the year 1850, I saw, in consultation with Drs. James Jackson and J. C. Warren, a lady, about 40 years old, who for a number of years had suffered from symptoms of fissure of the anus. She was very feeble, and in an anæmic state. There was very violent spasmodic contraction of the sphincter, which almost prevented the evacuation of the bowels. The patient being etherized, I was requested to operate. The fissure being of long standing, and much firm material effused about it, it was entirely excised, as in the last case. A tenotomy knife was then carefully worked in under the sphincter, which was put on the stretch by two fingers in the anus, and the muscle divided by a subcutaneous section. The patient, after the ordinary treatment, was effectually cured.

CASE CIII. — *Fissure of the Anus.* — Nov. 1862. A lady, 26 years old, began about a year and a half before, and not long after the birth of a child, to suffer from a pain in the region of the rectum, after defecation. This pain she referred, not to the anus, but to a spot in the rectum opposite the lower end of the sacrum. In the course of the day, a small collection of purulent matter would take place in the rectum, and the discharge of this was attended with most terrible suffering. The pains gradually extended to the sciatic and other nerves of the pelvis. She generally enjoyed pretty good health; was married, and had one child. The catamenia were regular, and there was no apparent trouble about the uterus. She was seen by a distinguished surgeon in the army, who exhausted every available means of relief, but to no purpose. I had no doubt, from the description which she gave me when I first saw her, that she had a fissure of the anus; although she could not believe that the pain which appeared to be so high up within the rectum,

and the pains in the limbs, could be attributed to this cause. On separating the folds of the anus, an ulcerated fissure, opposite the coccyx, was at once manifest; but an attempt to explore it with the finger was attended with such suffering that it was necessary to desist. I advised her to take a private room at the Hospital, where the operation was performed under ether. As soon as the irritability of the sphincter was overcome by the influence of the anæsthetic agent, the finger could be passed up into the rectum, which, so far as could be ascertained by the sense of touch, was in a perfectly healthy condition. The fissure extended from just within the margin of the anus into the rectum. The ulcer was of moderate depth, with hard and elevated edges. I firmly grasped the whole ulcer with toothed forceps, and dissected it out with scissors. The night after the operation, she was free from pain, and in fact had no pain for five or six days, during which time she had no evacuation of the bowels. At the end of this period, she took a laxative; and the evacuation which followed was attended with a little pain, as might have been expected while the wound remained unhealed. During the next week she did well, so far as regards pain about the anus; but she had one or two severe attacks of sciatica, which required the use of remedies. At the end of a fortnight after the operation, she left the Hospital, at her own request, to go to the house of a friend, apparently well. A week later I was requested to see her, and found that all the old symptoms had returned. Her bowels, from the want of proper management, had become quite costive, the discharges taking place in hard lumps. On examination, the wound was found to be nearly healed, and in a healthy state: it was touched with nitrate of silver. This application, conjoined with a laxative diet, gave relief for several days, when it had to be repeated. At this time she was compelled, by the illness of her husband, to return home.

In March, 1863, she came again to Boston, having a recurrence of all her troubles, with all their former severity. I advised her again to enter the Hospital, and to stay there until cured, if possible. She was etherized, and a crack was found in the same place as before, but not strictly in an ulcerated

condition. A cut was now made directly through it, and about a third part of the thickness of the fibres of the external sphincter included in the incision. This operation again afforded relief for a week or ten days, when the attacks of pain began to return at irregular intervals, often in the middle of the night, and assumed a violently hysterical character. Cauterization again gave partial relief. During this time the catamenia had been irregular, the discharge taking place three days every week.

She was kept under treatment for her general health, and soon entirely recovered. I saw her a long time afterwards, without any recurrence of her former troubles.

This case is important, showing how necessary it is to persevere in treatment, where the mind of the surgeon is confident of the cause of the symptoms. Here it was necessary to work constantly against the persuasions of the patient, who persisted that her sufferings had some other origin. This idea was still farther confirmed, when she did not get complete relief by a single operation.

FISTULA IN ANO.

The operation for fistula in ano is so common, and the treatment so settled, that it is scarcely worth while dwelling on. I would simply say, that, in those cases of fistula, running far up into the rectum, it is unnecessary to follow the internal cul-de-sac to its termination, which is often a bloody and dangerous proceeding. Generally, the incision should comprise that portion which is included between the openings of the fistula on the rectum and outside. The internal aperture of the fistula I have almost invariably found just within the anus, and more commonly on the anterior than the posterior side. The treatment of injections, as used by empirics, is generally ineffectual, and not only involves the loss of much valuable time, but gives much discomfort to the patient.

In regard to the rule for operating on phthisical patients, I should say, that, if the fistula causes no irritation, avoid interference. If much inflammation, with numerous external fistulous

openings, is present, causing great suffering, preventing exercise, and deranging the system generally, an operation often restores almost new life to the patient.

CASE CIV. — FISTULOUS OPENING NEAR THE ROOT OF THE COCCYX, IN THE MEDIAN LINE BETWEEN THE NATES; THE FISTULA CONTAINING HAIR. — The following case was presented for consultation; and is similar to those which I have frequently had under observation, but have nowhere seen described. The mode of its origin has not yet been clearly made out.

Jan. 1864. — A young man, 25 years of age, with very full development of hair on the body, applied to me on account of a small fistulous opening, which he had upon the sacrum, just between the folds of the nates. The first intimation which he had of it was from the exudation of moisture from this spot about one year ago. At first the discharge was thin, but afterwards assumed a purulent character. Recently the disease became more serious, and the soreness and inconvenience resulting from the discharge led him to seek medical aid. On examination, a small circular opening was seen, just large enough easily to admit a probe, looking as if the skin had become inverted at that point, and quite unlike the ragged, inflamed orifice of a common fistula. A sero-purulent matter oozed out from the interior. The probe penetrated upwards between one and two inches. I at once recognized an affection which I had frequently observed. On opening this fistula in similar cases, a small curl of hair has generally been found occupying the bottom of the cul-de-sac. This hair seems occasionally to act as a foreign body, giving rise to inflammation, with the formation of abscess, resulting in fistulous openings extending in various directions, thus often concealing the original difficulty. By a careful exploratory operation, however, the little wisp of hair may be discovered in some part of the sinus, lying perfectly loose, and unattached to the surrounding tissues. I have once seen this in a woman whose hair was dark, and more than usually developed in that region: all the other cases, numbering perhaps eight or ten, have been in men. •

The origin of this singular affection is involved in obscurity.

It would seem possible, however, that it may begin in the stout hair or hairs arising from a single follicle becoming in some way diverted from their normal direction, and inverted upon themselves within the follicle itself: the continued growth of the hair would then result in the formation of a tangled knot or ball of hair, which might readily give rise, after a time, to irritation, just as a similar accumulation of sebaceous matter in the follicles of the face may excite that form of inflammatory action known as acne. The occurrence of the disease in the median line between the folds of the nates may perhaps be explained by the constant pressure and moisture of the part, softening both the newly formed hair and the epidermic cells surrounding the mouth of the follicle.

The treatment of this affection consists in laying freely open the cavity or cavities where the occurrence of inflammation has involved the skin and subcutaneous tissue; or, in case the skin still remains healthy, the sac may be laid open and then dissected out. The integuments should be brought together with one or two sutures, thus insuring a more speedy cure than if a simple incision is practised.

This affection is interesting, in connection with what has just preceded it, from the fact that the persons who apply for relief almost always suppose that they are laboring under the disease of fistula in ano.

CASE CV. — *Fistulous Opening in the Neighborhood of the Anus, containing Hair.* — A man entered the Hospital, July 31, 1866, to be operated on for what he supposed to be fistula in ano. He had received a kick on the nates a year before; and a small, hard lump had been left, which had recently suppurated. There was an opening near the anus, and another near the coccyx, neither of which communicated with the rectum. A director passed freely from one to the other.

On laying the whole track of it freely open, a tuft of hair was found between the two openings, quite free, and entirely devoid of bulbs. The patient left the Hospital in about a week, in a fair way for recovery.

PROLAPSUS ANI.

The disease which goes by this name—and it is usually confounded with an eversion of the mucous membrane, attendant on extreme cases of internal hemorrhoids—is a very rare affection. The patients in my practice, in whom the whole calibre of the intestine prolapsed at each evacuation of the bowels, have generally been children of a scrofulous habit, who have suffered from obstinate constipation, from irregularity of the bowels, from dysentery, or from ascarides of the rectum. The disease has almost always yielded to an invigorating course of treatment with iron, a nourishing diet, which leaves but a little residue, and astringent injections. Before an evacuation, an enema of cold water or a solution of tannin was administered. I have also seen it in old persons, and in persons suffering from stone in the bladder, where the straining is extreme.

The records of the Massachusetts General Hospital give the following numbers, for a period of forty years; and probably one-half of these are misplaced, being cases of everted hemorrhoids:—

Total number of cases	19
Cured	11
Much relieved	4
Relieved	4

The treatment generally seems to have been by ligatures applied to portions of the mucous membrane around the anus, as for hemorrhoids. The following case I treated by cauterization with acid nitrate of mercury.

CASE CVI. — *Prolapsus Ani. Cauterization. Cure.* — A boy, aged 14, of English birth, entered the Hospital May 20, 1858. He said that he had a prolapsus when only two years old, which disappeared, and returned eight years after. The whole calibre of the rectum was forced down for one or two inches during every act of defecation.

The boy being etherized, the intestine was everted, and a ring of it cauterized with the acid mentioned above. The prolapsus was then reduced. The bowels were kept quiet for a number of days, but no recurrence of the prolapse occurred when they acted. He was kept under observation until it was certain that the cure was complete.

Where prolapsus is complicated with hemorrhoids, the treatment which relieves the latter will also relieve the former; i.e., the ligature or *écraseur*.

POLYPUS OF THE RECTUM.

Polypus of the rectum is a very rare affection, and usually of mild character. I do not remember having seen more than five or six cases of it. The first of the following, operated on by myself, is the only one recorded on the books of the Hospital up to 1860:—

CASE CVII. — *Polypus of Rectum. Removal. Cure.* — March 21, 1860, a boy, nine years of age, entered the Hospital, for a vascular tumor, which occasionally projected through the sphincter ani, it having been first discovered four years before. It gave him great discomfort. With the finger, I could distinguish it about two inches above the sphincter, of the size of a chestnut, attached by a broad base to the intestinal walls.

The patient being etherized, the tumor was dragged down outside, and removed by the *écraseur*. He was discharged well, on the 26th.

CASE CVIII. — *Polypus of Rectum.* — A gentleman, who had once or twice suffered from fissure of the anus, consulted me about a tumor which occasionally came down while the bowels were being evacuated, and became pinched by the sphincter. By a digital examination, a hard tumor, the size of a small walnut, was found hanging to the parietes of the rectum by a narrow stalk, about two inches from the external orifice. I advised its removal by twisting, or with scissors. His mind, however, being relieved as to the character of it, and being much occupied, the operation was deferred, and I heard nothing farther from him in regard to the tumor.

A year after, having fissure of the anus, which was operated upon, it was found that the tumor had disappeared. In all probability, it had been twisted off and discharged by the action of the bowels.

CASE CIX. — *Polypi of the Rectum. Fissure of Anus. Operation. Cure.* — In April, 1866, I was requested to operate on a lady who had been suffering for a number of years from a bad fissure of the anus, which, on examination by her physician, was found to be complicated with polypoid tumors of the rectum. The fissure, which was found to be in a very diseased and thickened state from long ulceration, was dissected out with the scissors. Three or four polypoid tumors were then hooked down from the rectum, and either cut off, or tied, where the vascularity seemed unusual. She had a slow recovery; but I heard of her two months afterwards in fine health and spirits.

CASE CX. — *Polypus of Rectum. Removal.* — A woman, about 35 years of age, very nervous and delicate, who had received much treatment without avail, entered the Hospital in April, 1866, — the same week that I operated on the last case. The functions were generally deranged, and there was scarcely an organ in the body which was not complained of. She remained, for the most part, in bed, saying that she was too feeble to sit up, and attributed her troubles mainly to a tumor in the rectum.

On examination, a tumor was discovered similar to those described above. It was dragged down and tied; the ligature coming away about the fourth day after the operation,

IMPERFORATE ANUS AND RECTUM.

It may not be considered inappropriate here to introduce the subject of malformation of the anus and rectum, which is one of great interest, as involving the question of operation and the life of the patient.

The following cases of imperforate anus, with malformation of the rectum, present several points of interest in connection

with the question of attempting to afford relief by a surgical operation. In simple occlusion of the anus, there can be no doubt of the propriety of opening it, either by puncture or crucial incision, maintaining the passage afterwards by the use of bougies. The great majority of cases, however, as they occur in practice, are by no means so easily disposed of; being, as a general rule, complicated with an imperforate condition of the lower part of the rectum, and, in many instances, also with an abnormal opening communicating either with the external surface of the body, or more commonly with the bladder or vagina. In a very considerable proportion, also, the anus is perfectly formed externally, but terminates within in a cul-de-sac; and a few instances have been recorded in which there was a total absence of the rectum, and even of the whole large intestine. Of this latter malformation I have seen one case, in which the large intestine was absent, with the exception of the cœcum; and the specimen has been preserved.

Upon the subject of operating for the relief of imperforate rectum, surgeons are by no means unanimous. The great fatality which attends these operations; the difficulty often experienced, in the after-treatment, to prevent the closure of the artificial opening; and lastly, and perhaps chiefly, the very imperfect character of many of the so-called cures, resulting in life-long discomfort to the patient, — have induced many surgeons of experience altogether to discountenance operative interference. On the other hand, the certainty of death, if left to nature; the fact that the operation has sometimes been fully successful; the promise afforded by improved operative methods; and, finally, the natural reluctance of the surgeon and friends to leave any thing untried which may possibly save life, — combine to justify any rational attempt at relief. The theory that the results are necessarily imperfect, which affords the only real argument against operating, is disproved by the very successful cases recorded by Benjamin Bell, Amussat, Latta, and others.

The operation which promises the best results, and which I have several times performed with success, consists in freely dissecting through the tissues which intervene between the cul-

de-sac of the rectum and the external surface of the body, then drawing down and puncturing the bowel, and finally securing it by sutures to the margins of the divided integument; thus forming a new canal with a continuous mucous lining, instead of the long fistulous passage which results from a mere puncture with the bistoury or trocar.

During the year ending June, 1864, I saw four cases of imperforate anus and rectum. In two of them there was a fistulous passage, communicating in one case with the vagina, and, in the other, opening in the perinæum half an inch in front of the normal position of the anus. In both of these cases, I was able to re-establish the natural passage by the operation just described. In a third case, upon which I operated by puncturing the distended rectum, the child died; and, in a fourth case, I advised against any operative interference. These four cases I propose to relate.

CASE CXI. — *Imperforate Anus, with Abnormal Opening of the Rectum externally. Operation. Cure.*—A female child was born with a small fistulous opening directly behind the vagina, and half an inch in front of the normal position of the anus, through which the fecal matter was discharged very slowly and with much difficulty. The child was therefore brought to the Hospital, where the opening was enlarged by one of the surgeons, who enjoined upon the parents to keep it from closing up again by the daily employment of tents. In spite, however, of the attention which was given it, the aperture became gradually contracted, so as to cause much distress whenever the bowels were evacuated, and to lead the parents to bring the child again for operation, in the spring of 1863, when it was about two years old. The operation was performed by passing a curved instrument into the fistulous opening, turning it backwards, and pressing the intestine down upon its point where the sphincter-ani muscle should naturally be situated. Here a dissection was made until the sound was exposed, and the intestine freely opened by a crucial incision. The intestine was now attached, by two or three points of suture, to the skin, and a tent passed into the

opening. The child bore the operation well. After a few days, the tent was removed; and the daily use of bougies, gradually increasing in size, was commenced. By the end of the third week, it became difficult to introduce the bougie, owing to the very powerful resistance offered by the sphincter muscle: this, however, always yielded to pressure, and the removal of the bougie was followed by a free discharge of fecal matter. At the end of a month, the child left the Hospital; the mother being requested to bring her twice a week in order to have the bougie passed, and the abnormal opening cauterized for the purpose of closing it. Three months afterwards, the case was lost sight of, a small fistulous opening still remaining, through which there was occasionally a slight discharge; the new anus performing its functions perfectly.

CASE CXII. — *Imperforate Anus, with Rectum opening into the Vagina. Operation. Relief. Death from Gastric Irritation two months after. Malposition of Intestine.* — In June 1863, a fine, healthy girl, six weeks old, was brought to me, with the rectum terminating in the vagina. An incision had been made by the attending physician, at the point where the anus would be naturally situated; but he had not succeeded in establishing the passage. On account of the very early age of the child and the small size of the organs, it was very difficult to determine the exact condition of the parts. The mother said that the child was perfectly well, except that the discharges took place through the vagina. A probe passed into the vagina entered about two inches: in front of this, another probe could be passed into the urethra, these two passages being entirely distinct. After considerable manipulation, it was found that the whole posterior wall of the vagina, and the adjoining anterior wall of the rectum, were wanting. The operation for the restoration of the natural passage was done as follows: A large silver hook, with a ball at the end, was passed into the vagina, and forced down against the spot at which it was proposed to make the new opening. Here it could be indistinctly felt through the thick mass of the soft parts which intervened. A crucial incision was made through the skin, and the soft parts dissected

to either side, until the silver ball, pressing down the intestine, was felt in the wound, the wall of the intestine only intervening. A small aperture was now made in the gut, and the hook passed through so as to hold the parts in position. The opening in the intestine was then enlarged, and its margin stitched to the integument by four sutures. A plug was then introduced into the opening to the depth of an inch and a half or two inches. After the operation, a free discharge took place from the vagina, showing that the plug would not interfere with the passage of the feces while the new anus was being established.

A large and well-formed canal was established in the normal position, through which well-formed, solid discharges took place, from time to time, while the more liquid feces still made their way through the vagina. The child was too young and the vagina too inaccessible for any attempt to be made to close the abnormal passage: this it was proposed to do at a later period. For a while, the child enjoyed perfect health; but subsequently was attacked with gastric irritation, and died Aug. 4, 1864.

The following extracts from a letter from Dr. Cox, of Salem, the attending physician, give an account of the *post-mortem* appearances:—

“On Tuesday, the 2d, I first saw her. She had constant nausea, and vomited almost every thing she took into her stomach, and had no alvine discharges. These symptoms continued, more or less urgently, till her death, on the 4th, except that the bowels were slightly moved several times. Independently of the state of the atmosphere of late, this condition was perhaps remotely caused by a malformation and transposition of the large intestine, in consequence of which a free and thorough evacuation of the organ seldom, if ever, took place. . . . The rectum ascended from the anus to the right iliac fossa, thence up through the right lumbar region to the under surface of the liver, touching the gall-bladder. Then it bent sharply downwards, and descended, in contact and parallel with the ascending portion, to the right iliac fossa. The colon then crossed the lower part of the abdomen to the left iliac region, up through the left lumbar region, almost to the stomach, terminating in the cœcum. . . . The portion discolored with bile, from its contact with the liver, is where the sudden and abrupt bend of the organ downwards took place. This sharp flexure must have proved

a serious obstruction to the evacuation of the bowel. From this turn to the caput coli, the bowel was very much distended with flatus, and contained more than a quart of soft fecal matter of the consistency of thin mortar. The only other morbid change found was an injected and softened state of the mucous coat of the stomach."

An incision being made in the back part of the rectum, near the anus, displayed a very great contraction of that canal just before its original termination in the vagina. In fact, following this contraction was a cul-de-sac which communicated with the vagina, about its middle, by a delicate valvular opening: the artificial anus continued the intestine down to its natural external termination. It will be understood, therefore, that, instead of a free communication between the intestine and vagina, there was a plaited condition of the mucous membrane, as in the ordinary termination of the canal.

The descending colon in this, as in another published case, was transposed; so that any operation for artificial anus, as usually practised in the left lumbar region, would necessarily have failed of its object. I would advert to the very interesting fact, exemplified in the present case, and to which attention has many years since been called by Dr. J. B. S. Jackson; viz., the very constant termination of the intestine in the vagina in cases of imperforate anus in the female. Dr. Jackson has also remarked, that, in all the cases of simple imperforate anus that he has examined in the male subject, a small opening has been found between the rectum and the membranous portion of the urethra; and this opening in the male he regards as analogous to the one above referred to in the female. This is well depicted in Plate X. of Dr. William Bodenhamer's valuable work entitled, "Congenital Malformations of the Rectum and Anus."

CASE CXIII. — *Imperforate Rectum. Operation. Death.*
—April 9, 1864. A very small child, three days old, which had not yet nursed, was brought to me with the rectum imperforate about three quarters of an inch above the anus. Though the child was quiescent, the abdomen was distended almost to bursting. A finger, being introduced into the anus, encountered the obstruction; but there appeared to be no rounding out of the

septum, indicating the continuance of the canal above. It was, however, decided to make an exploratory puncture with the trocar. When the instrument was thrust in, the meconium began slowly to flow out, until at least half a pint had escaped, and, pressure being made upon the abdomen, flatus followed. The finger was then passed up above the obstruction, so as to freely dilate it. No large cavity or depot of the fluid could be detected. It was advised that the finger should be passed up once or twice a day, which the medical attendant promised to do, and also to report the course of the case.

The child took food immediately after the operation, and, for a time, seemed relieved. It died, however, the same night, about twelve hours after the operation. At the autopsy, a quantity of blood was found in the abdominal cavity, but no meconium. A fibrous cord about an inch long intervened between the rectum below and the cul-de-sac of the imperforate intestine above. The great distention of the intestine by meconium had forced it down into the pelvis, bringing it in contact with the bottom of the anal cavity. On thrusting in the trocar, the intestinal contents freely escaped; but, on the withdrawal of the canula, the upper portion of intestine retracted, and the aperture in it closed so as to be with difficulty distinguished. The oozing of blood into the abdominal cavity probably took place from the lower aperture. The very unusual state of the parts disclosed by the autopsy showed that no operation could have been of service.

CASE CXIV. — *Imperforate Rectum*. — May 12, 1864.

A female child, not quite 24 hours old, was brought to me with imperforate rectum. The abdomen was quite distended, vagina and anus natural; the little finger could be passed half an inch within the anus, when it was suddenly arrested. When the child strained, a sensation was felt of something pressing down on the finger; but it did not convey the impression of a portion of intestine distended with fluid. On passing the little finger of the other hand into the vagina, the uterus could be distinctly felt as in its natural position. The finger could then be passed over the finger in the anus against the spine, but

detected no tumor; nor could any appearance of distended intestine be distinguished elsewhere, although the finger could be turned round and felt through the parietes of the abdomen. A probe was passed a little way into the urethra, but did not penetrate the bladder, although urine, thick and apparently semi-purulent, was discharged when the examination commenced. It was thought possible, but not probable, that the intestine might communicate with the bladder. Under the circumstances, no operation was advised. Dr. D. W. Cheever, who had examined the patient the day before, had already given the same opinion.

The child lived nine days, taking little or no nourishment, the abdomen becoming gradually more and more distended. On *post-mortem* examination, the intestine was found to terminate in a cul-de-sac between one and two inches above the imperforate anus: the sigmoid flexure, instead of being in its proper place, was found transposed to the right iliac region, where it lay in contact with the right side of the vagina, from which it could readily have been reached and punctured. A probe was easily passed to the fundus of the uterus, the os and cervix being very large. I was surprised to find with what ease the little finger could be passed without violence to the very bottom of the vagina, a fact which may be of material importance in elucidating some of these very obscure cases.

The specimens of this and the previous case are now in my private collection.

CHAPTER VII.

GENITO-URINARY ORGANS.

STONE IN THE BLADDER.

SINCE the introduction of lithotrity and the use of ether, the operation for stone in the bladder has undergone a very great amelioration; and, though once considered of a most formidable nature, it is now, in many cases, almost stripped of its terrors.

While in Europe, through the politeness of Sir Astley Cooper, I had an opportunity of seeing some of the earliest instances of lithotrity performed by the improved stone-breaking instruments of Heurteloup; and afterwards, having witnessed the unparalleled skill of Civiale in breaking the stone, and having followed the lessons of Amussat, I was early led to adopt lithotrity instead of lithotomy. I pursued this practice, though not to the entire exclusion of lithotomy, for about thirty years, without the loss of a single life. During the spring of 1866, however, I lost two patients: both of them died after a single operation of the mildest character; and an investigation showed that death would have resulted, whatever course might have been adopted.

The cases in which it may be well to employ lithotomy are, in the first place, children; secondly, persons with large and hard stones, or with organic changes in the bladder or prostate. I have, however, frequently relieved old persons, even where the prostate has been considerably enlarged, by repeated, but not prolonged, lithotritic operations.

The success of lithotrity, so far as my own observation goes, depends upon the following circumstances: 1st, To inject the bladder moderately with water; 2d, To use an instrument of moderate size, and so constructed as thoroughly to clear itself of the fragments; 3d, Not to move the instrument about too

freely. By not observing this last precaution, inflammation may be excited, and even gangrene and death ensue. By at once gently sinking the beak of the instrument into the most dependent part of the bladder, opening and giving it a slight oscillating movement, the stone will, in almost every instance, fall readily into its grasp, and may then be raised into the middle of the cavity, and broken. The same process may be repeated upon one or two of the larger fragments, taking care, however, not to protract the operation beyond a few minutes. A large catheter may then be introduced, and some of the finer particles allowed to escape through it. Usually two or three days elapse before the bladder recovers sufficient tone to expel the fragments spontaneously.

In old persons, in whom the prostate is more or less enlarged, the stone is often concealed in a cavity behind it, and requires that the beak of the instrument should be turned backwards, and the stone pushed out from its lodging-place, before it can be properly seized.

Ether is a most valuable adjuvant in a great proportion of cases of lithotrity. When I first urged its employment in this operation, in a paper published in "The American Journal of the Medical Sciences," in 1848, many surgeons objected (and some still object) to its use, upon the ground that the consciousness of the patient is necessary to give warning if the folds of the bladder become entangled in the jaws of the instrument. In answer to this objection, it may be stated, that the mere contact of the instrument, in an irritated state of the organ, will give rise to greater suffering than the actual engagement of the mucous membrane in other cases; and, to a surgeon at all in the habit of performing this operation, the interposition of a fold of soft tissue is at once perceptible, although I have never known any unusual pain manifested from this circumstance. In cases of extreme irritability of the bladder during an advanced stage of the disease, where there is an entire want of power to retain the urine, I have been astonished at the great quantity of ether which is required to produce perfect relaxation, so as to admit of the injection of the small amount of water necessary to prepare it for the subsequent manipulations.

In regard to the method to be preferred in *lithotomy*, I have generally adopted, until lately, that of Dupuytren, by the bilateral incision. This is still a favorite with some French and many American surgeons. Its chief peculiarity consists, as is well known, in the transverse incision of the skin, which is made directly in front of the anus; and, secondly, in the double division of the prostate by the *lithotome caché*.

The absence of important nerves and vessels in the median raphé affords a strong argument in favor of the median over the common lateral incision; and the revival of perineal section by Mr. Syme has demonstrated the fact that the bladder may be safely and easily reached in this manner. Influenced by these considerations, I have several times operated by a median incision in the raphé, dividing the prostate with the double lithotome or with a bistoury. The advantage of this method over the transverse incision of Dupuytren is the greater room which it affords for the withdrawal of the stone through the external wound, while all its peculiar advantages are secured by the double incision of the prostate.

Lithotomy, notwithstanding the extraordinary success said to have been attained in certain sections of our own country, is nevertheless, in town and hospital practice, an operation attended with considerable risk.

The operations for stone, in New England, may be said to be very rare, but in the limestone regions of the South and West are quite common. Dr. J. C. Warren, in a paper published in 1844, stated, that, in the course of forty years, he had been called on to perform all the operations for stone which had been done in Boston. The whole number had not exceeded twenty-five cases, and the population had increased during this time from twenty-six thousand to upwards of a hundred thousand. Of the twenty-five cases, not more than three were in persons natives of Boston or vicinity. During the succeeding ten years, from 1844 to 1854, he operated for stone quite a number of times. In the course of about ninety years one hundred cases were operated on by Dr. John Warren, John C. Warren, and myself, and the specimens are in my possession. In the last thirty years, I have operated on rather more than

thirty cases ; and the operation has also been performed by other surgeons. Most of these cases were from a distance, but four or five of them belonging to Boston. Two-thirds of them were operated on by lithotrity.

The following cases are selected as illustrating some particular features either in the history or the operation : —

CASE CXV. — *Vesical Calculus from the Introduction of a Bit of Sealing-wax. Spasm of Bladder, relieved by Opium. Repeated Operations. Recovery.* — A man, 24 years old, entered the Hospital April 11, 1846, who, four months before, employed a piece of sealing-wax to remove a supposed stricture in the urethra. A portion about an inch long, and a fourth of an inch in diameter, slipped into the bladder. Soon after, he began to have symptoms indicating the presence of a stone.

With the straight sound, in the bladder I readily detected the calculus ; and, passing the finger into the rectum, reached it without much difficulty. It appeared to be on the right side of the bladder.

April 12th. The patient being properly prepared, water was injected into the bladder ; the lithotrite was introduced, and the stone seized and crushed. The water was then permitted to escape from the bladder, bringing with it pieces of the calculus. The bladder was allowed to rest for four days.

On the 16th, and subsequently several times during the month, the operation was repeated. At length, however, the presence of the lithotrite caused spasm of the bladder, which grasped the instrument so firmly as to interfere with its free use. The patient suffered so much from these trials, that he requested the operation of lithotomy. At a consultation, in consequence of this request, I introduced a very large, long staff, such as I proposed to employ in the operation, when, to my surprise, no spasm occurred.

On May 2d, all the preparations were made for lithotomy and lithotrity ; and the patient took a hundred and fifty drops of the tincture of opium, an hour before the time fixed for the operation. The bladder was injected with half a pint of warm

water; the lithotrite was introduced, no spasm occurred; the operation was performed; and, in a quarter of an hour, about a teaspoonful of fragments was discharged. He suffered no inconvenience from the tincture of opium.

A consideration which had influence in leading me to fall in with the patient's wish for a cutting operation was this: in three instances, after repeated operations of lithotrity, the stone has appeared to become sacculated; owing, I suppose, to inflammation of the mucous coat of the bladder. Being apprehensive, from the difficulty of discovering the remaining fragment, that this process was going on, I wished to prevent its completion.

He experienced so much relief from the use of the opium, that I resolved to try its effect when injected into the bladder. Two drachms of the tincture were therefore injected, on May 4th, with half a pint of warm water: from this he found much ease. On May 6th, I injected two drachms of the tincture of opium, mixed with two ounces of warm water, at 9 $\frac{1}{2}$, A.M. In an hour and a half afterwards, I injected as much water as the bladder would receive, not exceeding a gill and a half, and then introduced the lithotrite without much pain. The fragment not being felt, an additional pillow was placed under the pelvis. It was then discovered in the upper part of the bladder, seized twice, and broken. No great pain was experienced, and a discharge of about a teaspoonful of broken calculus took place soon after.

He afterwards submitted to several similar operations, experiencing no inconvenience; and, by June 20th, was relieved, and a week later was discharged.

Remarks. — The stone in this case was very soft, and always broken with great ease. There was never any lodgment of it in the urethra, and only on one or two occasions any difficulty in withdrawing the lithotrite charged, through the meatus. A peculiarity in the management of this case was, that, after the apparent introduction of the instrument, the stone was not reached until the handle was carried downwards towards the perinæum, forming an angle of 45° with a line perpendicular to the body in a horizontal posture. From this I concluded

that the anterior part of the bladder had become contracted; or else that the stone had formed for itself a pouch between fasciculi of the bladder, an occurrence which I think frequently takes place during the lithotritic treatment. The introduction of water as a preliminary step always brought on pain, and rendered the patient somewhat unmanageable. Occasionally, the water was omitted, and the operation was performed with less pain and in less time than usual; while there was no reason to believe, that, under any circumstances, the mucous coat of the bladder was included between the jaws of the instrument. After the stone was removed, the irritability of the bladder was at once diminished, so that the patient, who before was very sensitive to the slightest motion of the instrument, allowed the bladder to be explored in every direction, almost without shrinking. The physical sensibility of the patient was much increased by the fear of being cut. This case illustrates the great advantage we have since derived from ether in overcoming the contractions of the bladder.

CASE CXVI. — *Calculus of Oxalate of Lime. Stricture. Lithotrity under Ether. Purulent Absorption. Recovery.* — A man 20 years of age entered the Hospital, November, 1847, having suffered with urinary difficulties for nine years: eighteen months before entrance, he contracted a venereal affection, which left him with an urethral discharge. On examination, the urethra was found to be so contracted as hardly to admit the smallest sized bougie. The stricture was gradually dilated by the introduction of bougies increasing in size; but, notwithstanding the enlarged passage and the free egress of the urine, he complained of much pain at the extremity of the urethra, and was obliged to pass his water ten or twelve times in the twenty-four hours.

In March, 1848, he came under my care. Suspecting the existence of some foreign substance in the bladder, and the urethra being extremely sensitive, I placed him under the influence of ether, and, introducing a sound, detected a stone.

Having waited a few days to allow the bladder to recover from the effects of sounding, on March 11th the operation of lithotrity

was done. The patient was first etherized, so that the muscular system was in a state of complete relaxation; half a pint of warm water was then injected into the bladder. A small lithotrite was introduced, and the stone seized; but it proved to be too hard. A larger and more powerful instrument was substituted, by which the stone was broken with repeated strokes from the hammer. Some difficulty was found, on withdrawing the instrument, in passing the seat of the stricture, on account of its jaws being clogged with sand, and therefore imperfectly closed. The patient was entirely insensible during the whole operation, and not the slightest contraction of the bladder impeded the necessary manipulation.

The continuation of this history, as derived from the Hospital records, is in substance as follows:—

In an hour after the operation, he passed urine, with several pieces of gravel, and some fine sand, in all nearly half a teaspoonful. The urine contained a little blood, which was apparently from the urethra. In the afternoon, he had a severe rigor, lasting fifteen minutes; passed urine once, a quantity of gravel coming away with it; some small pieces of the gravel, which had lodged in the urethra, were removed with the forceps. The bladder was washed out with cold water: cold compresses were also applied to the urethra, from which a little blood had been oozing. In the night, he complained of headache, pulse full and hard. He was bled to 12 oz. with much relief; slept well.

March 12th. — Morning. Comfortable; pulse 96. Some small fragments came away. Afternoon. Pulse 140; headache, no tenderness of bowels, and but little irritability of urethra; passage of urine free.

13th. The smarting and pain were very slight; but little detritus in the urine. Twelve leeches to perinæum, with a warm bath and enema, were ordered. In the afternoon, had a chill; complained of malaise, pain in the shoulders, back of the neck, and weakness of the right arm; pulse 130.

16th. Pulse 120. The countenance somewhat depressed. Complained of great pain in the right shoulder and arm, as well as between the shoulders; also in loins and left side of

back; tenderness along the course of the left carotid artery; no trouble in passing urine, and but little soreness of the urethra.

From the 17th to the 22d, the febrile symptoms continued, the pulse being somewhat over 200, perfectly distinct and regular. The patient being very feeble, a stimulating treatment was pursued.

22d. I opened an abscess over the tarso-metatarsal articulation of the left little toe, and found the bone denuded.

23d. Pulse 190. From this period the frequency of the pulse began to diminish, and he went on slowly improving until April 2d, when he was seized, during the afternoon, with a severe pain about the left clavicle and upper part of the left side of the chest. Great swelling had taken place since noon, so as to almost bury the clavicle. It also extended up the neck. The integuments over the clavicle were red and œdematous. He had great difficulty of breathing, and the pressure on the trachea almost produced suffocation. I immediately made a dissection down to the clavicle, but no pus could be discovered. The bone itself was evidently enlarged, and my impression from the symptoms was that pus was forming in its interior. The pain was less on the following day.

On the 21st of April, the swelling about the clavicle had nearly disappeared, but the inner third of the bone was felt to be enlarged. From this period he slowly recovered, and left the Hospital free of complaint.

Remarks.—The operation in this case was rapidly done, with no violence to the bladder, as shown by the symptoms at the time and afterwards, none of which had reference to that organ. The stone was small. Not being aware of the hardness of it, I thought it would yield to a small instrument. The power of this not proving sufficient, it was withdrawn, and another introduced; which, however, was so constructed as not to clear itself of the detritus or sand made by the crushing process. From this reason, the instrument which passed the obstruction caused by the stricture with ease, on its introduction, was arrested there on its withdrawal, from the jaws being imperfectly closed; and some force was required, though not amounting to violence.

It will be perceived that the fragments of stone all came away within a week of the operation. In three days after its performance, pain in the shoulders began, after which all the symptoms denoting purulent absorption were manifested. The pulse, for six or seven days after the 17th, remained constantly very rapid, ranging from 190 to 212. There seemed to be a tendency to the formation of pus in different parts of the body: it was found about the metatarsal bone in the foot, and was presumed to exist in the clavicle; from the latter it was probably absorbed without making any appearance outwardly.

This case will evidently come under the category of those placed by Velpeau and Civiale as instances of purulent absorption, now called pyæmia, sometimes caused by the simple introduction of a catheter, but more frequently in lithotrity by the irritation of fragments lodged in the urethra, and about the neck of the bladder.

The stone was analyzed by Dr. Bacon, who gave me the following note of its constituents: "It consists chiefly of oxalate of lime: it also contains considerable uric acid, and a small quantity of carbonate of lime. The concentric layers are very numerous. In some fragments under the microscope, I counted from ten to twenty, or even more layers, in the space of one-fiftieth of an inch. The radiated structure is also seen under the same circumstances, the radii being still finer than the layers which cross them at right angles."

CASE CXVII. — *Cystic Oxide Calculus. Lithotrity. Cure.* — A man, aged 43, a resident of New York, applied to me in July, 1848. Seven years before, he was seized with a violent pain in his side, which was attributed to the passage of a calculus through the ureter. Shortly afterwards, a calculus of the size of a pea was voided with his urine. He had a number of times since passed calculi.

In April, while engaged in ploughing, he felt a pain in his bladder, the commencement of the sufferings from which he applied to be relieved.

I sounded him with a small lithotrite, and detected a calculus, which measured an inch and a half. Slight irritation of

the bladder followed this examination ; and it was necessary to keep him quiet for a few days, and use remedies, before any operation could be performed.

On July 13th, the bladder being injected with half a pint of warm water, the stone was immediately seized with the crushing instrument, and broken, by means of the screw, without much difficulty.

15th. He had suffered no inconvenience from the operation, and in fact felt relieved. A quantity of sand and fragments of stone had passed with the urine.

The operation was repeated on the 18th, 23d, 26th, 29th, and Aug. 2d. After each operation he passed a number of fragments ; and once or twice it was necessary to remove, by the forceps, portions which had become lodged in the fossa navicularis. On Aug. 3d, a fragment which had been engaged in this way, and which it was found impossible to extract entire, was seized by a powerful pair of dressing forceps, crushed, and thus extracted piecemeal.

On the 9th he returned home well ; and on the 25th I received from him a letter, in which he informed me that he had experienced no difficulty in passing his water, and was otherwise in good health.

Dr. Bacon kindly made an analysis of the stone, which is contained in the following note : —

"The calculus, of which you sent me fragments yesterday for analysis, proves to be of a rare and interesting kind. It is composed of *cystine* or *cystic oxide*. The yellow portions consist of cystine in a state of purity, with the exception of a trace of phosphate of lime. In the white friable parts, which appear to be interspersed in the yellow masses without forming regular layers, the cystine is mixed with much phosphate of lime and a little triple phosphate. Your specimens agree pretty closely in physical characters with the description given by authors of this very uncommon form of calculus."

This case of cystic oxide calculus is interesting from the extreme rarity of this kind of stone. M. Civiale, whose great experience is well known, states in his work on the stone and gravel, published in 1840, that he has met with but four cases

of it. In the Hunterian Museum, out of six hundred and forty-nine calculi, it appears by the catalogue there are but three of the cystic oxide.

It has been stated that an hereditary disposition existed in many of these cases; two of those under the care of M. Civiale were brothers. In the present case this disease was not inherited, according to the account of the patient.

CASE CXVIII. — *A very large Cystic Oxide Calculus. Sac in Bladder. Lithotrity. Death, three weeks afterwards, from Inflammation of the Bladder, and Pyæmia. Diseased Kidney.* — May, 1866. The following case is the first instance of death, after the operation for stone, which has occurred to me in a practice of over thirty years. The *post-mortem* appearances showed that this termination was almost inevitable.

The patient was a shoemaker, of spare habit, and rather poor constitution; and had been confined with a severe attack of pleurisy on the left side about a year before, soon after which his troubles commenced. The first symptoms were a pain in the urethra, and smarting on micturition; the stream being suddenly checked, and restored again on a change of position. All these symptoms were aggravated, and had become insupportable when I first saw him.

I introduced gently a sound, and, detecting the stone, sent him to the Hospital.

Being etherized, a small lithotrite was introduced, May 5, and the stone sought for. It was not at once seized, however, though apparently of very large size. Finding something uncommon in the case, I withdrew the instrument, which contained some flocculi of mucous membrane, and some calcareous fragments. The bladder was now injected with water more fully, a large instrument introduced, and the stone, measuring between two and three inches, seized. This was carried to the middle of the bladder, and crushed with some little force. The small fragments were then caught five or six times, and broken. The whole operation lasted less than five minutes.

There was some fever on the following day, but the water

was passed more freely than before. On the third day, there was tenderness over the bladder. During the next two weeks, many of the fragments were passed, though with difficulty. I had decided that he could not undergo the repeated operations for destroying so large a stone, and that, as soon as he was in a proper condition, I would remove the remaining portions by lithotomy.

At the end of three weeks, when he had passed a day more comfortably than common, had taken solid food, and seemed to be improving, he was suddenly taken, in the night, with a faintness, and died.

The following appearances were presented on examination. The bladder was greatly thickened. On its posterior and upper part was a sac communicating with it, which was quite thin towards the peritoneum, and in a state of high inflammation. There was also peritonitis, but no rupture could be detected. The right kidney was about one-quarter its natural size; its pelvis and infundibulum were greatly dilated, and filled with purulent matter and calcareous deposit; the cortical substance, in a great measure, having disappeared. The ureter was thickened. The left kidney was about one-third larger than natural. Half of a cystic oxide calculus was found in the bladder, and weighed 480 grains; also a fragment weighing 22 grains. All the rest of the stone had been crushed, and had passed off by the urine. The whole stone must have weighed 960 grains. The right lung was adherent at its apex. The left lung had very extensive pleuritic adhesions; and, on cutting into its substance, pus escaped from various points, showing purulent absorption.

It is probable, on the first exploration with the small lithotrite, that the stone was started from its bed in the sac, which inflamed, and gave rise to the subsequent symptoms.

In addition to the preceding cases of cystic oxide calculus, I have had a third, in a man under my care for fracture of the thigh. During his confinement to bed, he was seized with violent symptoms referred to the kidneys, which subsided after the expulsion, *per urethram*, of several minute calculi, which proved on examination to be composed of pure cystine. The urine also contained a deposit of cystine, in large microscopic crystals.

CASE CXIX. — *Oxalate of Lime Calculus. Lithotrity. Cure.* — An Irish boy, 15 years of age, was brought to me in October, 1848, with symptoms of great irritability of the bladder, such as usually accompany the existence of a foreign body in that organ. At that time he declined all examination, although I warned him of the probable nature of the disease.

In November, nearly a month afterwards, finding that no remedies had any effect in relieving his sufferings, he submitted to the operation of sounding, and quite a large calculus was discovered.

His mother gave the following history of his case: He had been troubled in the urinary organs from infancy. When three years old, he had a violent attack of pain in the region of the right kidney, for which he was leeches and blistered. He recovered for the time, but afterwards was seized with a pain lower down on the same side, attended with difficulty in passing water, and with bloody urine. From that time, he was almost constantly troubled. He was obliged to pass his water every half hour, and it escaped involuntarily during sleep. He could not walk fast without pain, and passed blood occasionally.

On account of the size and hardness of the stone, and the age of the patient, I advised the operation of lithotomy; but the parents would not listen to a cutting operation, where any other method was available. I therefore determined to etherize the patient, make an attempt with the crushing instruments, and, if the stone was found to resist farther than was thought safe, to relinquish this operation and advise lithotomy, which his friends would probably consent to when the former was found to be impracticable.

On Nov. 16th, the first operation was done; the bladder was injected; the crushing instrument passed in, and the stone seized. It measured one and a half inches. Attempts were made to crush it by means of the screw; but this was found impossible on account of its hardness. The hold was therefore relaxed, the stone seized in a new position, more on one side, and was then broken down without any great violence. The fragments were crushed a second and a third time.

He suffered somewhat in the bladder after the operation. A

number of fragments of the calculus were passed, which, on being analyzed, were found to consist of the oxalate of lime, combined with the triple phosphate, which showed itself in glittering transparent crystals. The latter seemed to have been deposited on the surface, and were exceedingly sharp and irritating to the touch.

20th. The operation was repeated; the stone, when first seized, seeming to resist the action both of the screw and hammer: but, after a little perseverance, it was finally crushed by percussion.

The following morning, a number of pieces were passed, and, among others, apparently the original calculus from the kidney: it was of a lightish-brown color, about the size of a small bean.

The operation was repeated six times at intervals of a week. The time devoted to the seizing of the stone was generally about five minutes. From the great hardness of its composition, it could not be crushed into sand, as is the case with the phosphatic and uric-acid calculi. The fragments were large, and required to be seized and crushed separately.

Twice in the course of this period, portions became engaged in the orifice of the urethra; and it was necessary to administer ether, and extract them, as the canal was so sensitive that nothing could be done without the assistance of this agent. Finally, the last fragment of the stone, which for some days had been lodged in the neck of the bladder, and which I had once pushed back, became suddenly fixed at the membranous part of the urethra, so as to entirely obstruct the course of the urine. To disengage this, Hunter's forceps were introduced: the stone was at length caught, and drawn to the fossa navicularis. From this spot it was found impossible to extract it without laceration of the urethra: the hold on it was therefore relinquished, and, by the use of forceps, portions were gradually broken away until the whole was removed.

The patient, after this, fully recovered; no symptoms remaining to denote the existence of an irritation of thirteen years' standing.

CASE CXX. — *Vesical Calculus. Lithotrity. Recovery.* — A gentleman, 30 years of age, consulted me in November, 1853. He had the first symptoms of the disease in 1843. He had previously, after a nephritic attack, passed a small calculus from the urethra. The symptoms, at the time of the operation, were great pain, a frequent desire to pass water, bloody urine, and inability to bear the jolting of any vehicle. The water was passed every half-hour, both day and night. The measure of the calculus, when first seized by the lithotrite, was fourteen lines in diameter. It was easily crushed, with scarcely any pain; fragments passed off, without difficulty, in the course of twenty-four hours. The operation was repeated three times in a fortnight, without the use of ether, giving scarcely any more uneasiness than an ordinary case of catheterism; and the patient was perfectly relieved in about three weeks.

CASE CXXI. — *Vesical Calculus. A Pebble for Nucleus. Bilateral Lithotomy. Recovery.* — On Nov. 7, 1847, I saw in consultation a child four years of age, affected with symptoms of some foreign substance in the bladder. The child was thin, delicate, and tall for his age. The history of his disease was as follows: —

Two years and a half previously, as the child was making water in the street, a boy, in attempting to wrest a knife from him, pulled him over, and dragged him through a heap of gravel. When taken up by his mother, a quantity of this substance was found adherent to the glans penis. For twenty-four hours, he had an almost complete stoppage of water. At the end of that time, an examination being made, disclosed a small bit of gravel lodged just within the orifice of the urethra. It was removed by a knitting-needle, and immediate relief obtained.

Some months after the preceding occurrence, the child began to complain of difficulty in passing his water, attended with frequent desire to evacuate the bladder. These symptoms, with intervals of ease, continued till within a few months of the time when I saw him. Then they became much aggravated, so as to make it imperative to have active measures taken for his relief; the sufferings both by day and night being almost constant,

and the calls for evacuating the bladder incessant. All attempts at an introduction of a sound being resisted, he was etherized, and I discovered a calculus.

On Nov. 16, an operation having been determined on, the child was fully etherized, and a sound placed in the bladder. Lithotomy was performed by the bilateral method; the incision of the prostate being made with a straight, probe-pointed bistoury. The stone was removed by a large polypus forceps. No bad symptoms followed the operation.

On the following day, the water passed by the urethra; on the third, by the wound; and continued to do so for a week, when it resumed its natural course.

On page 95 of the "Appendix to Etherization, with Surgical Remarks," will be found a description of the stone, with some comments upon its presumed method of introduction, by Dr. J. C. Warren, in these words:—

"The stone was about half an inch long, the fourth of an inch thick, and in form of a flattened oval. It was sawn by Dr. J. B. S. Jackson. The exterior layer consisted of a whitish deposit, the sixteenth of an inch in thickness, and composed apparently of triple phosphate. The layers within this were of a brownish color, like that of the phosphate of lime, and were about half a line in thickness. In the midst of these was a harder substance, about a line in diameter, which appeared to be silicious. Its outline could not exactly be distinguished from the surrounding layers of brown deposit.

"The retrograde passage of the apparent nucleus into the bladder may excite surprise, unless we take into consideration the inverted action of the urethra, by which bodies received into it are so often conveyed from without into this organ, where they serve as the nuclei of stones. The introduction of this nucleus may receive an additional explanation from the fact, that the gravel-stone, removed by the mother, prevented the passage of urine forced into the urethra by the strong contractions of the bladder; and this, not escaping, was driven back by the contractions of the urethra, carrying along the inner stone, which formed the nucleus."

The first of the following cases illustrates the ordinary bi-

lateral operation of Dupuytren, and may serve to compare this method with that adopted in the next case, where the primary incisions were novel, but the final ones identical with those of Dupuytren : —

CASE CXXII. — *Vesical Calculus. Bilateral Lithotomy. Recovery.* — A boy, 12 years old, had been troubled for two or three years with a want of power to retain his urine : the suffering had been excessive, both by day and night. He was in a very miserable and emaciated condition, but had recently, however, for a few weeks, been much more comfortable ; a fact which was afterwards explained by finding the stone fixed in the upper part of the bladder. The prepuce was very long, owing to the habit of constantly pulling at it. On sounding him, under ether, the stone was felt in the upper part of the bladder. It was decided to perform lithotomy, which was done by the bilateral method of Dupuytren. A sound of good size was introduced, making a great curve outward, so as to project well in the perinæum. A semilunar incision was then made above the anus, and the staff reached at the membranous portion of the urethra. Dupuytren's double lithotome was now passed into the bladder, with its concavity upwards ; and, the sound being removed, the instrument was reversed, its blades opened to the extent of seven-eighths of an inch, and withdrawn. The forceps were now introduced ; the finger having previously been used to explore the stone, which was found firmly adherent to the upper part of the bladder. The stone was seized with some difficulty, owing to the firm adhesions which it had contracted with the folds of the mucous membrane ; but it was finally extracted without injury to the organ. It proved to be a mulberry calculus, very rough and irregular in outline, and weighing 180 grains. A piece of elastic catheter was kept in the wound for twenty-four hours, after which it was dispensed with. On the third day, a little water was passed by the urethra ; and, on the tenth day, it had entirely resumed its natural channel. All the distressing symptoms of stone were immediately relieved by the operation ; and, at the end of three weeks, the patient was discharged well.

CASE CXXIII. — *Vesical Calculus. Median Lithotomy. Recovery.* — A boy, 13 years old, entered the Hospital in March, 1863, on account of great suffering in the region of the bladder, accompanied by incontinence of urine. Two years before, he noticed an occasional difficulty in passing water; at times a sudden stoppage of the stream occurred, and the urine was now and then a little bloody. The symptoms became more urgent, and the pain constant, so as to confine him to his bed. The urine dribbled away, and irritated the skin of the penis, scrotum, and thighs. The prepuce, as in the last case, was much elongated.

On introducing a sound, the instrument encountered much resistance at the neck of the bladder, but finally passed in and came in contact with a stone. The bladder was quite empty of urine; and the calculus meeting the sound at different points, while enveloped in the mucous folds, gave the impression of the existence of two or more stones.

It was decided to perform lithotomy, after relieving the external irritation by cleanliness and suitable dressings.

The operation which was performed combined some of the more important features both of the median and bilateral methods, and seems to offer some advantages over either. A sound of medium size was passed into the bladder; the meatus urinarius, which had become very much contracted, being first slightly enlarged by the knife. The skin was then divided in the median raphé, and the dissection continued in the same line until the membranous part of the urethra was exposed. This was next opened, and the attempt made to introduce the double *lithotome caché* of Dupuytren. Owing to the unyielding condition of the neck of the bladder, the lithotome could not readily be passed in; a probe-pointed bistoury was therefore substituted for it, and the prostate divided on both sides. The finger now entered with ease, and a large stone was felt very high up in the bladder. Attempts were made to extract it with a long pair of polypus forceps, and then with the ordinary lithotomy forceps, but without success, owing to its great size; the cut in the prostate was therefore enlarged, and the attempts at extraction renewed, but still unsuccessfully.

As it was not deemed safe to enlarge the incision in the prostate further with the knife, the two forefingers were introduced, back to back, and the substance of the gland slightly torn. A larger pair of forceps was then passed in; and, by embracing the whole stone within its jaws, it was extracted without further difficulty. A piece of catheter was placed in the wound, and the patient sent back to bed.

On the ninth day, the urine began to pass through the urethra; and, from the twelfth day, none escaped by the wound. At the end of three weeks, the patient was discharged, with the external wound nearly healed, and free from all symptoms of stone.

The calculus, which appeared to be composed of the triple phosphate of magnesia and ammonia, was large and very rough: it measured $3\frac{1}{2}$ inches in its longest circumference, and $2\frac{3}{4}$ in the shortest; its weight was 240 grains.

I was led to perform the operation in the manner related; viz., by making an incision through the skin in the median raphé, instead of the cross cut employed by Dupuytren, as illustrated in the first case, from having observed how easily these parts could be dilated in the incisions practised in perineal section for the division of strictures, frequently impassable by the smallest sound. In these cases, after cutting through a deep perinæum filled with inflammatory exudation, it is often found necessary to exercise much patience, and to spend much time in tracing the urethra beyond the stricture. Having had occasion, during the past few years, to do a number of these operations, most of them entirely without any guide, I was led to the reflection, that it would be very easy in this way to perform the operation of lithotomy when the operator is guided by the presence of a large staff in the urethra. When the median section is performed deliberately, the operator has the parts divided freely open to the view; which is not the case in Dupuytren's operation, which has to be performed mainly by the sense of touch. By this method, also, the vessels are much less likely to be wounded than in the common operation. Although different kinds of operations must of necessity be practised to suit different cases, the present method would seem to be the most direct and natural one for arriving at the blad-

der. Since performing it, I have found that a similar operation had been suggested by Mr. Erichsen, who had not at that time, however, performed it upon the living subject. Mr. Allarton's and Mr. Beaumont's operations, although done in the median line, are essentially different.

I have in my possession a large calculus, removed from the body of a gentleman after death, which had been lodged behind the prostate. He had suffered with it for many years; and, finally, it was the cause of his death. He had been sounded by a number of distinguished surgeons, and by some declared to have a stone, by others not. From this reason, he had deferred, for many years, submitting to an operation. By sounding under ether, and turning the beak of the instrument backwards, I detected a stone; but an operation was thought inexpedient, on account of the great disease existing in all the urinary organs. After death, the kidneys were found extensively ulcerated, the ureters enlarged, and the bladder greatly thickened and sacculated, with a cavity or depression behind the enlarged prostate, in which the calculus was lodged and partially concealed.

CASE CXXIV. — *Vesical Calculus of Oxalate of Lime in a Child three years old. Bilateral Operation. Recovery.* — March, 1857. The symptoms appeared a year and a half before. The sufferings were intense, preventing sleep, and producing all the usual symptoms of stone in the most aggravated form. The patient had been twice sounded, while under the influence of ether, by experienced surgeons; but no stone was detected. After etherizing him, I introduced a common sound, but, with the most careful examination, assisted by the finger introduced into the rectum, failed to find any calculus. The instrument was therefore withdrawn, and a sound with a slight curve at its end, somewhat similar to the one described by Mercier for exploring the prostate gland, was used. This, being passed in, and taking up less room than the common sound, at once struck a stone, which lay very high up in the bladder.

I at first proposed to destroy the stone in this case by the crushing process, but soon found that the bladder was too much contracted to contain sufficient water to allow the instrument to be manœuvred safely. The bilateral operation was performed, and a large stone removed. The coats of the bladder were much thickened, and its cavity greatly elongated, so that quite a long pair of forceps was required to reach and dislodge the stone. The patient slept soundly the night after the operation, being the first good night's sleep he had enjoyed for more than a year. At the end of a week, the urine passed by the urethra; and, in another week, the child went home well.

CASE CXXV.—*Vesical Calculus of eighteen months' standing. Median Lithotomy. Recovery.*—A boy, $4\frac{1}{2}$ years old, had always enjoyed good health, with the exception of the following symptoms, which had lasted about eighteen months. At first, he was obliged to pass his water more frequently than usual,—as often as twelve times during the twenty-four hours. He soon had great difficulty in inducing the flow of urine, making bearing-down efforts, and exhibiting signs of pain. A correct diagnosis was not made. Owing to constant pulling, to relieve the pain at the end of his penis, the prepuce was greatly enlarged. His health was much reduced; his sleep was interrupted by pain, and desire to pass urine, which dribbled away.

On entering the Hospital, he was etherized and sounded, when a calculus, about the size of a filbert, could be easily felt. The urethra was found unusually capacious.

Four days afterwards, the patient was again etherized; the bladder was filled with warm water; an ordinary grooved staff introduced; and an incision, about one and a quarter inches in length, made in the median line of the perinæum. The staff being reached, a probe-pointed knife was passed along the groove, and a lateral incision was made through the prostate. This incision was made bilateral by the *lithotome caché*. The calculus was extracted with some difficulty. The dust from the calculus consisted of oxalate of lime, carbonate of lime, triple phosphate of ammonia and magnesia, and urate of ammonia.

On the third day after the operation, he passed a little water by the urethra; it then stopped, and for four days passed by the wound; after which, it passed entirely by the urethra.

About a fortnight after the operation, the patient exhibiting some symptoms indicating the presence of calculus, a sound was introduced into the bladder; but nothing was discovered.

A month later, the child was seen again, after a visit of ten days in the country. He was in a state of perfect health, his whole condition having been entirely changed by the removal of the stone.

CASE CXXVI. — *Vesical Calculus. Median Lithotomy. Recovery.* — June 17, 1865. A boy, aged $3\frac{1}{2}$ years. The symptoms were first noticed when the child was but little more than a year old, and were as follows: water passed often, attended with difficulty and pain, at times dribbling away in drops; sleep much disturbed; phimosis.

For over a year, he continued to grow worse. In the autumn of 1864, according to medical advice, took cod-liver oil, which improved his general health. During the winter, micturition was involuntary. His appetite was good, and he slept well when not disturbed by pain.

On entering the Hospital, an examination was made while the patient was under the influence of ether. The prepuce was found to be almost impervious, admitting only a small probe through its aperture. It was slit up along the dorsum of the glans, and the raw edges were brought together by a few sutures. A sound was passed into the bladder, when the calculus was easily detected. Analysis of urine showed it to be cloudy, light-colored, with considerable precipitate of a ropy character. It was albuminous, corresponding to the deposit of pus corpuscles; very faintly alkaline. Under the microscope, a large number of crystals of the triple phosphates, interspersed with pus and mucus corpuscles were observed.

A few days afterwards, the median operation was performed, as detailed in the previous case, and a very large calculus removed with much difficulty, notwithstanding the prostate was notched on both sides after the first section. The effect of the

operation was at once to entirely relieve the patient from pain. The third day after, he passed a few drops of urine by the urethra; at the end of a week, the water passed freely by the natural passage; at the end of two weeks, he went home quite well.

STRICTURE OF THE URETHRA, WITH RETENTION OF URINE.

I do not propose to enter into the treatment generally pursued for strictures of the urethra, but think it of great importance to allude to those cases where, from some accidental cause, a sudden retention takes place, attended with alarming symptoms. The surgeon's first impulse is to relieve the patient by the use of an instrument. This is frequently found impossible, and it is abandoned, leaving the patient in a worse condition than before: in fact, a passage already excessively small has become almost obliterated by swelling, and, of course, no instrument can be made to penetrate it. Nothing, indeed, needs greater forbearance on the part of the surgeon than to restrain himself from instrumental interference, when the patient is crying out in agony to be relieved from his suffering. The course which I have generally found successful in such cases is as follows: First, where it is possible to temporize, to give an opiate enema. Second, to cover the perinæum and lower part of the abdomen with anodyne fomentations. By these means, sleep is generally produced, attended with profuse perspiration; and, when the patient awakes, he can empty the bladder. Sometimes, even during sleep, the urine gradually trickles away. After this, by pursuing an antiphlogistic course for a day or two, a small bougie may be passed, and the stricture treated in the ordinary way by dilatation. Third, if the suffering is excessive, and the distention so great as ordinarily to indicate puncture of the bladder by the rectum, the patient may be etherized, when, by passing down a filiform bougie, and inserting it partially into the stricture by a twirling motion, I have often seen the urine at once begin to flow by its side; and in one or two instances, on withdrawing it, a small stream

followed, which continued to flow until the bladder was completely emptied.

In a patient who applied to me, not long since, for the treatment of a stricture of long standing, I found that it was impossible to pass a filiform bougie. He was, therefore, put under treatment, and instruments abstained from. A few days afterwards, he was seized with a chill, and sent for me to visit him. Not being able to attend, I requested a friend to see him. He found a large, hard tumor over the pubes, and a retention of urine. The patient, however, complained of no pain, although the case seemed almost to indicate the necessity for some surgical interference. The condition of things being reported to me, I advised the treatment by opiates and fomentations, as above suggested. It was followed, in the course of the night, by relief to the bladder. On the succeeding day, the tumor still existed, though not quite so large as on the preceding day; and the patient stated that he had noticed it for the previous eight months, though smaller than in this attack. I saw him some weeks subsequently, with the tumor undiminished in size, although a good-sized bougie could be passed through the stricture, where, at first, none would penetrate. The tumor was doubtless the bladder in a thickened condition, partially filled with water, and was the result of long-continued obstruction to its delivery.

CASE CXXVII. — *Retention of Urine relieved by Introduction of Capillary Bougie and Opiate Enema.* — A young man, 28 years of age, on retiring at night, found that he was unable to urinate, and, in the morning following, also failed to do so. Five years before, he had gonorrhœa: this was followed, two years subsequently, with complete stoppage of urine, which was relieved by the use of a catheter, and since he had never made a full stream. He consulted a physician, who tried to introduce an instrument, but was unable to accomplish it. He was then directed to me in a very suffering state, with the bladder much distended. I at once introduced a capillary bougie of the smallest size, which passed into, but not through, the stricture. On withdrawing it, the urine began to dribble away.

He was then directed to go to the Hospital, where he had a warm bath given him, and an enema of forty drops of tincture of opium in a wineglass of starch. In about four hours after this, he was able to empty his bladder, making quite a fair stream. He remained in the Hospital a number of days, until he could be safely discharged, declining any systematic treatment for his stricture.

CASE CXXVIII. — *Stricture of Urethra. Retention of Urine. Relieved by Capillary Bougie.* — A man, 35 years of age, was brought to me on a Sunday morning in November, 1861, suffering greatly from inability to pass his water. Some years before he had gonorrhœa, the effect of which lasted for the better part of a year. He indulged freely in ardent spirits. On Saturday, after getting wet in a storm, he was taken with a stoppage of water. Every means were tried by his physician to relieve him. On Sunday, finding all applications fail, he sent him to me for advice. I found the bladder distended. My first disposition was to send him to the Hospital, and try the effect of antiphlogistic and narcotic remedies, before attempting the use of any instrument, as the catheter had been already tried without effect, only producing a discharge of blood. His pain, however, was so excessive, that I decided to attempt the use of a means which, three times before, I had found effectual in cases of retention attended with very close stricture. Taking one of Charrière's smallest bougies, almost capillary, I gradually passed it down the passage, and carefully, without pressure, worked it into the stricture, which took a firm hold upon it. The patient being cautioned not to strain, it was now slowly withdrawn, when a small and irregular stream of water followed. He was requested to stand up; and slowly, by jets, some blood now and then passing out, the bladder was freed, and almost entire relief from the excessive torment obtained. The patient was sent to the Hospital, a warm bath given, and an enema of forty drops of tincture of opium after it.

He had a good night; and on the following morning passed his water easily. He was kept on a liquid diet, and on the 13th left quite well.

CASE CXXIX. — *Gutta-percha Bougie broken off in the Urethra. Fragments ejected spontaneously.* — 1853. A young man applied to me while suffering under an obstruction in passing water, for which he had been subjected to much treatment, without relief. He had contracted a gonorrhœa nine months before, and had a gleet since. The symptoms indicating stricture, he was advised to have the urethra explored. A small wax bougie was first selected from a bundle, but rejected from being a little injured. The next that offered was one of gutta percha; and, being of the requisite size, it was softened in the hand, and passed up readily to the prostatic portion of the urethra. Meeting here with some obstruction, it was withdrawn, the point a little softened and bent, and it then went easily into the bladder, without the use of any force. On taking hold of the instrument to withdraw it, after it had remained a minute or two *in situ*, it broke off short at the orifice of the urethra; or, rather, dropped off, as not the least violence was applied to it. I requested the patient to stand perfectly still, not having any question at the time but that, with a forceps, it could be seized, and readily withdrawn. This was found impracticable. It seemed to retract, and bury itself in the anterior wall of the urethra; and any attempt at seizing it only resulted in laceration of the lining membrane. Various instruments were tried, which I had generally employed in withdrawing foreign substances; but, from the peculiarly soft nature of the material in the present instance, and its small size, it could not be detected or seized. Efforts were made, by passing the finger into the rectum and by manipulations on the external part of the urethra, to force the fragment forwards; but, from the reasons mentioned above, viz., its softness, small size, and its not distending the canal so as to make itself perceptible, nothing could be effected in this way. The patient was sent to the Hospital; and as it was found practicable to pass a catheter by the side of the bougie, and free the bladder, it was concluded not to cut down for the purpose of removing it, but for the present to leave the case, so long as the symptoms were not urgent, and see what nature would effect. He was ordered a warm bath, and confined to his bed on a liquid diet. The day following, he was

free from pain, and had passed water while in the bath. On the third day, he observed a hard substance through the walls of the urethra, making its way towards the orifice: this he assisted a little, and extracted a bit of bougie an inch in length, very brittle, and shrivelled up. On the fifth day a still larger piece was passed, and on the sixth the remainder of the instrument, making in all about seven inches. He suffered very little from its presence in the urethra, his principal complaint being the soreness of the urethra near the meatus, caused by the attempts made to extract it; which, however, had been conducted with the utmost care, and soon discontinued, as they were found to be useless. The patient quickly recovered, and was completely relieved from his previous troublesome disease.

I have often used the gutta-percha bougies for taking impressions of strictures, and, until the present case, had never experienced any accident from them. In order to be employed with safety, they should be made fresh when required for use, as they become extremely brittle on exposure for any length of time to the air.

PERINEAL SECTION.

Mr. Syme, of Edinburgh, was the first to call the attention of the profession to this operation for the relief of stricture.

In the "American Journal of Medical Sciences for 1861," I published a paper upon this subject, in which I advocated the extension of the operation to a class of cases not included by Mr. Syme; viz., to those strictures in which instruments are impracticable, arising either from injury or disease. Mr. Bryant recommended for them, in Guy's Hospital Reports, puncture of the bladder through the rectum. In a number of instances, I have introduced a staff as far as the stricture; and then, cutting down upon it, searched for the continuation of the urethra, and, when found, divided it by careful touches of the knife. If the urethra is found with difficulty, the patient may be allowed to recover from the influence of the ether sufficiently to make an effort to pass water, and then the bulging portion of the urethra near the bladder can be pierced, and the stricture

divided from behind forward till the end of the staff is reached ; or, without this assistance, the urethra may be immediately cut down upon near the bladder.

A few cases are selected, which show the advantages of perineal section, even in the most desperate cases.

CASE CXXX. — *Organic Stricture of the Urethra of ten years' standing. The Urine finally passed in Drops. Retention. Perineal Section. Division of the Stricture. Complete Recovery.* — A man, about 30 years of age, entered the Hospital on April 30, 1860, with a stricture of the urethra of ten years' duration. The water, when he entered, passed in a very small stream ; and it was constantly dribbling during the night, accompanied with a purulent discharge. He complained of pain in the renal region, though not of a severe character. After very careful attempts to pass a bougie of the smallest description, it was finally decided to incise the stricture from within, which was done on May 15th with temporary relief.

On May 26th, the urine became less free ; there was considerable dulness in the pubic region ; and the patient complained of pain about the bladder, with general uneasiness.

On the next day, I found he had a complete retention of urine, and proceeded at once to perform perineal section. He was placed on a table on his back ; and after being thoroughly etherized, so that his joints were fully relaxed, he was tied, as in the operation for lithotomy. I have found it much better to confine the limbs in this way, than to intrust them to the care of assistants, who are apt to be worn out during an operation so likely to be long and tedious. A small staff was introduced ; and it seemed to penetrate the first stricture, which was incised about a couple of weeks before, and brought up against a second, apparently just behind the root of the scrotum. The forefinger of the left hand was then introduced into the rectum, and the situation of the prostate ascertained. The perinæum was then divided, and a careful dissection made to ascertain the site of the urethra. This was rendered very tedious by the hemorrhage from the bulb at the bottom of the deep wound, which

in this case was more than ordinarily troublesome. The urethra, however, was finally opened directly in front of the prostate, and a large gum-elastic catheter passed through the wound into the bladder, giving exit to a very large quantity of urine. The canal was now opened forwards, and the callosities freely divided, until the staff was reached. A second gum-elastic catheter was now passed downwards, through the penis, until it appeared in the wound: the ivory end of the first having been cut off, the point of the second was insinuated into it, and firmly fixed. In this manner it was dragged up through the whole extent of the urethra. In similar cases, where it is difficult to find the urethra, and where other means have failed, the course might be pursued which was adopted in the present case. I allowed the patient partially to recover from the ether; stimulated him to make an effort to urinate; and when the urethra, behind the stricture, became dilated, a minute stream of urine issued, indicating the spot for the introduction of a probe, and the urethra was found.

No unpleasant symptoms followed the operation: the patient was comfortable, and relieved from the sense of fulness caused by the distended bladder and ureters. At the end of a week, the first catheter, being removed, was found to have been partially acted upon by the urine, and its calibre somewhat obstructed; it was replaced by another.

At the end of a month, he was able to introduce the instrument himself; and, at the end of two months, the wound in the perinæum having healed, he kept it in at night, leaving it out during the day.

He shortly after left the Hospital entirely well.

CASE CXXXI. — *Stricture of the Urethra of twenty-five years' duration. Numerous Urinary Fistulæ in the Scrotum and Perinæum. Perineal Section. Cure.* — A man entered the Massachusetts General Hospital on April 24, 1860, and gave the following history of himself. He had suffered from gonorrhea twenty-five years previously: he then had a slight stricture, which, after fifteen or sixteen years, became so tight as to give him a great deal of inconvenience, for which he

entered the Hospital under my care, and was treated by internal incision. This relieved him for a time. In 1858, a fistulous opening appeared in the perinæum, followed by two in the scrotum: through these openings, purulent matter, with urine, was freely discharged. The whole of the scrotum was tense, indurated, and burrowed by sinuses. Two months previous to his admission, a No. 1 bougie was passed into the bladder after much effort, by which his symptoms were aggravated.

I passed a No. 1 bougie down to the stricture, and kept it applied for two or three hours daily, exerting a gentle pressure against the stricture. After treatment for about a week in this way, the stricture gave way, and the instrument passed into the bladder.

Notwithstanding the passage of the bougie, the disease of the scrotum increased; and towards the 1st of June, the stricture having again closed, so that it was quite impossible to pass any instrument, perineal section was done at his request, on June 4th.

He was etherized, and confined in the position for lithotomy. Syme's sound was passed through one stricture, and encountered a second. An incision was made in the median line of the perinæum, until the point of the staff was reached. The dissection was tedious, from the hardening of the tissues by infiltration, and on account of the hemorrhage, which was very free: the perinæum also was uncommonly deep. In order to see more clearly the continuation of the urethra beyond the stricture, the end of the staff was turned out through the incision, and served to hook up, and thus bring the deeper parts more fully into view. The wound being freely sponged with iced water, a puncture was made into the urethra, in the neighborhood of the neck of the bladder, into which a probe was passed, and the urine allowed to escape. A large gum-elastic catheter was substituted for the probe. A sharp-pointed knife was passed up by the side of a small Syme's sound; and the first stricture, which lay behind the middle of the scrotum, was freely divided. The catheter was drawn up through the urethra, as in the last case.

The first catheter was left in place a week; then, becoming obstructed, it was replaced by another, and this was done weekly

through the course of the treatment. The wound in the perineum, on account of the diseased state of the tissues, was very slow in healing; and the patient remained in the Hospital for two months afterwards.

A communication was received from him in November, 1860, in which he stated that he was entirely well.

CASE CXXXII. — *Traumatic Stricture of the Urethra of five years' duration. Vesico-rectal Fistula.* — A teamster, 36 years of age, came into the Hospital under my care in the early part of the spring of 1860. He said that, five years before, he had been jammed against a wall by the buffer of a freight-car, with such force as to produce a rupture of the urethra. He remained in a critical situation for a time, and had never since been able to pass his water except in a very small stream.

On examination by the rectum, I found that the bladder, intestine, and surrounding parts, were glued together, and involved in an indurated mass, and the calibre of the intestine was very much diminished. *Fistulæ* had formed by the side of the rectum, and there was communication between the bladder and the rectum. A probe being introduced into the fistula by the side of the rectum, passed up by the side of the intestine, through the indurated tissues, and apparently entered the interior of the bladder. No ordinary means afforded relief; and I advised him, unless willing to have perineal section performed, to desist from any further efforts, for fear of producing irritation and complete retention, especially as he did not suffer much from his disease.

In June, having heard of the success of perineal section in other cases, he came back to the Hospital for the purpose of having it performed upon himself.

The operation was performed, and a catheter introduced, as in the first case.

Not the slightest unfavorable symptom followed; but at the end of the week, when it was necessary to replace the catheter, the end of the instrument escaped into the rectum. This was prevented by hooking the beak of the instrument against the

pubes ; and then, instead of trying to force it forwards, the handle was suddenly depressed, and it slipped into the bladder. Carried forwards in the ordinary way, it always went into the rectum.

Before the end of the month, the urine was passed by the catheter, although there was purulent discharge through the fistulous opening near the rectum, and occasionally from the rectum itself. The patient remained in the Hospital rather more than two months, when he left, and has since been seen well.

CASE CXXXIII.—*Urethral Fistula from Bullet-wound. Perineal Section. Recovery.*—A young man, 20 years of age, entered the Hospital, June 3, 1865, having been wounded in the attack on Fort Steadman in the preceding March. The ball grazed the side of the penis, taking out a piece of the prepuce, and, passing through the scrotum, carried away the right testicle. It then penetrated the deep muscles of the perinæum, following the course of the urethra, and came out just below the margin of the anus. When wounded, he was in an erect posture ; he fell insensible, and was at once carried to the rear.

On entering the Hospital, the entire wound was found to have healed, with the exception of the fistulous opening below the anus. He was obliged to urinate once in two or three hours, and the greater portion of the water escaped through the wound near the anus. He had previously been repeatedly informed that nothing could be done to relieve him. On examination, a stricture was found near the prostatic portion of the urethra ; and a bougie, introduced into the meatus, emerged at the anal opening of the wound. I directed that a bougie should be inserted daily down to the stricture. On June 28th, the usual operation for perineal section was performed. The end of the sound being reached, the posterior portion of the urethra was found involved in a mass of cicatricial tissue ; and great difficulty was experienced, after the wound was enlarged, in finding the orifice of the urethra which led to the bladder.

This, being found, was freely divided, and a large gum-elastic catheter introduced through the whole course of the urethra. On the following day, he was quite comfortable. On the 8th

of July, the catheter was removed, and the wound in the perinæum was healing rapidly. No urine escaped from the old wound, near the anus, after the operation. A few days after this, he passed a full stream, a few drops only escaping through the perinæum, which was rapidly granulating.

He shortly afterwards left the Hospital, but returned from time to time, during the following five or six months, to have an instrument passed. His recovery, so far as I know, was complete.

CASE CXXXIV. — *Traumatic Stricture of Urethra. Perineal Section. Recovery.* — July, 1863. A tall, thin, delicate boy, 16 years of age, tripped, while walking on the top of a fence, and came down astride of it, striking the perinæum, and producing a rupture of the urethra. At first, there was a bloody discharge from the urethra, and retention of urine, which was relieved, at the time, by the use of a catheter. The next four months were passed in great suffering, and with frequent attacks of retention of urine. In January, 1864, six months after the occurrence of the accident, the retention became complete; and an operation was found necessary to relieve him. A distinguished practitioner was sent for from a distance, who cut down upon the urethra in the perinæum, having first introduced a catheter into the penis as far as possible. The urethra was reached at the point where the obstruction commenced, but could not be traced farther; and, although an elastic catheter was introduced into a passage which seemed to communicate with the bladder, it was afterwards found not to reach that organ. From that time until I saw him, six weeks after, he had periodical returns of retention about once a week, which were relieved by the escape of a small portion of solid matter, followed by a jet of urine. Improvement for about a week followed; but, at the end of that time, the retention again occurred. The urine showed a constant tendency to escape by the perinæum, unless prevented by closing the orifice by the finger.

After watching the case for a week, during which time he had an attack of complete retention for eight or ten hours,

which was only relieved by opium and ether, I finally operated on him on the 8th of March, 1864.

He was placed in a strong light, and fully etherized: a capillary bougie was passed into the urethra, and the end of it appeared at once through the opening in the perinæum. The dissection was now made upwards towards the spot at which the bougie escaped from the urethra, in hopes of finding a continuation of the passage in its vicinity. On dissecting to this spot, which was underneath the scrotum, near its root, no trace of the inferior portion of the urethra could be discovered. After exploring for a time with a hooked probe, a small opening was detected at the side of the other, but not in a direct line with it. Into this, a second capillary bougie was passed, which evidently penetrated to the bladder. The whole length of this passage was now gradually laid open, being through a solid adventitious deposit. There was no possibility of passing a probe, even at the side of the bougie, until arriving nearly at the neck of the bladder; the urethra being, in fact, constricted throughout the whole perineal portion. A probe was now passed into the bladder; and a catheter of medium size, being first passed into the meatus, was carried by the side of the probe into the bladder. On withdrawing the probe, a quantity of calcareous matter escaped. In the course of the night, a stoppage took place, which could not be relieved either by using the stylet of the catheter or by injections; and the urine began again to escape by the opening in the perinæum. On passing the finger into the rectum, the bladder was found to be half full of semi-solid matter, feeling like a bag of putty. This proved to be a phosphatic deposit, which had probably been for a long time collecting, owing to the extreme narrowness of the passage through which the water trickled. The elastic instrument was therefore removed, being dragged away with some slight difficulty, owing to the calcareous substance which adhered to it. This was replaced, fortunately without much difficulty, by an S-shaped silver catheter. The bladder was syringed out twice a day with water, and some of the phosphatic substance brought away at each injection. This catheter became stopped on the following day, and had to be taken out and replaced,

which was effected under ether. He ultimately recovered, requiring the occasional use of the instrument to maintain the free passage of the canal.

CASE CXXXV. — *Stricture of Urethra of twenty years' standing. Fistulæ in Perineo. Perineal Section.*—A man, 56 years of age, thin, pale, and of miserable aspect, entered the Hospital in March, 1865, with strictures of the urethra of twenty years' standing. The urine trickled away in drops or a fine stream, and no instrument could be passed into the bladder. Some years before, he had a perineal fistula, which, after treatment, closed; the urine resuming its natural channel. His strictures had, however, continued to grow worse. After a trial of several weeks, a capillary bougie was passed without violence through the first stricture, which was just in front of the scrotum. It was left for half an hour every day in the stricture, gradually dilating it. A second stricture was soon discovered opposite the middle of the perinæum, where a callosity could be felt of the size of a marble. The bougie was finally passed through this obstruction also into the bladder. Despairing of getting in any larger instrument as a guide, as the introduction of this small one had already occupied several weeks, I determined to operate. A free incision was made, in the usual manner, in the perinæum; and a long and patient dissection performed before the urethra could be discovered, the bougie, from its smallness and flexibility, scarcely serving as a guide to the touch. The urethra was found to have been pushed to one side of the median line by inflammatory exudation. It was opened at the strictured part for the length of about half an inch, after which it admitted a No. 8 elastic catheter from the wound into the bladder. To divide the other stricture behind the scrotum, a director was carried up from the wound to the stricture, and on it a concealed knife was passed, and the constriction with some difficulty divided; there being a disposition to push the stricture in front of the knife, owing to its extreme toughness. A No. 6 elastic catheter was now introduced into the meatus, and passed into the bladder, though with difficulty; for the external stricture grasped it with some force. The

patient was placed in bed, and an elastic tube attached to the catheter to convey the urine into a receptacle placed for it beneath the bed. For the first time for many years, the water flowed freely from the bladder. On the following day, the stricture had already, from absorption, so far relaxed its hold upon the instrument, as to admit of its easy withdrawal, and the introduction of a larger one; a proceeding rendered necessary also from the obstruction of the eyes of the first one by the mucus of the bladder. For the same reason, it was ultimately necessary to substitute an S-shaped silver catheter for the elastic one; after which the obstruction did not recur, and the man made a good recovery.

CASE CXXXVI. — *Traumatic Stricture. Perineal Section. Recovery.* — June, 1865, a man, aged 49, entered the Hospital. Three years previously, he fell a distance of eight feet, coming down astride of a beam. This was soon followed by abscesses, which resulted in urinary fistulæ. On entrance, the scrotum and integument of penis were greatly swollen and œdematous. At the middle portion of urethra, through the scrotum, a hard tumor, the size of a goose's egg, could be detected. The urine passed only in drops. A capillary bougie could be made to enter with difficulty into the bladder.

Perineal section and the operation for phymosis were performed about two weeks after coming to the Hospital; and, in a little more than three weeks after the operation, the patient was discharged well, the scrotum and penis having resumed their natural dimensions, and the urethra being thoroughly pervious.

CASE CXXXVII. — *Traumatic Stricture. Perineal Section. Recovery.* — April, 1865. A laborer, two years before, received an injury to the perinæum, which was succeeded by a stricture of the urethra. Subsequently, fistulous openings appeared in the perinæum, which communicated with the urethra: these, however, healed. On entering the Hospital, it was found that the urine escaped from the meatus in drops, while the greater portion made its way through fistulæ on the under aspect

of the penis, and that there were several strictures; one near the meatus, and the others in the membranous portion of the urethra. The penis was œdematous.

Perineal section and the operation for phymosis were performed, and the patient discharged nearly well, one month after the operation, and two months after being admitted.

CASE CXXXVIII. — *Traumatic Stricture. Perineal Section. Recovery.* — March 13, 1861. A laborer, aged 53, received, about three months before, a blow in the perinæum, where an abscess formed, and, twenty-four hours after injury, broke, discharging blood and urine; leaving a fistulous opening, through which patient voided his water for two months prior to his coming to the Hospital.

On examination, an impermeable stricture was found about one inch anterior to the triangular ligament. The fistulous opening in the perinæum admitted a probe for the distance of an inch.

March 23d. Perineal section was performed, and the stricture divided. In six weeks, the urine was passed through meatus, the wound healed, and the patient discharged well. The convalescence in this case was protracted, the patient having repeated attacks of erysipelatous inflammation and hemorrhage.

DISEASES OF THE PROSTATE GLAND.

The affections of the prostate gland are of great importance, and require quite as much delicacy in their treatment as do strictures of the urethra. Stealing on gradually in persons about sixty years of age, they do not often require the assistance of a surgeon until almost complete stoppage of water has taken place. It will then be found, that the patient, for some time previously, has passed his water very frequently, and that finally it has begun to dribble away from him insensibly: on passing the catheter, a large quantity of fetid urine is evacuated; and it will at once be seen, that, for a long time, the bladder has been but partially emptied. In most instances, the prostatic catheter can, with great care, be made to enter the bladder: in others, however, the passage has been rendered tortuous by the en-

largement of the third lobe of the prostate, and great care is required, or mischief will be done with the instrument. In these cases, I have managed best with a French gum-elastic catheter, terminated with an almost capillary point, and having the eye, or aperture in it, at about two inches distance from the termination. This may be introduced as far as the obstruction, with a stylet within it: by a sudden motion, it may then be shot off from the stylet, and carried into the bladder. If carefully withdrawn, after remaining in place for some hours, it will generally retain the curvature of the tortuous passage. Where there is much pain or irritation from the introduction of the instrument, it had better be left in the bladder for the greater part of the twenty-four hours. If these causes do not exist, the water may be drawn off two or three times a day. Most patients, after having a paroxysm like the above, are relieved, and things go on for a time as usual: in others, where the pain and suffering has been very great, secondary symptoms come on; and, just as the patient seems to have got through his difficulties, a cerebral affection supervenes, and he dies with all the symptoms of uræmia. Where blood is thrown out into the bladder, and no urine passes on the introduction of the catheter, an injection of water may be made; and, after a day or two, the coagula become dissolved, and pass off without difficulty. Cases, which at first look very formidable, often turn out favorably, even in persons of quite an advanced age.

WOUND OF THE BLADDER.

CASE CXXXIX. — *Remarkable Case of a Wound of the Bladder.* — A young, vigorous, and brave officer was struck by a ball, which passed directly through the pelvis, just behind the hip joint, penetrating the bladder, the urine escaping from both openings of the wound. An examination by the rectum, as reported by the patient, revealed the fact that the left lobe of the prostate had been carried away. A catheter was introduced and kept in the bladder, and the urine allowed to pass through it during the treatment. Inflammation took place in the course of the urethra; and an abscess formed in

front of the scrotum, breaking there, leaving the urethra open for a space of nearly two inches. At the time of the reception of the wound, there was a sense of numbness produced in both lower extremities. After a long and tedious confinement, he regained fair health, having an aperture in front of the scrotum, through which the urine passed when the bladder was evacuated; the recovery being in other respects good, considering the gravity of the injury. He returned to his post, and took part in an engagement, five or six months afterwards. Shortly after this, he consulted me; being nervous on account of a want of power which he felt in the lower extremities, and which he feared might lead to paralysis. These symptoms I attributed to his riding on horseback. On examination of the wound made by the ball, I found the scars on either side of the pelvis in a healthy condition; and, on examining the neck of the bladder, a bridle could be felt in the rectum against the left lobe of the prostate, where the injury had apparently been. The aperture in front of the scrotum was large, and a great part of the urine escaped through it during micturition; but there was perfect control over the neck of the bladder.

This case is a very interesting one, from the fact of there being so serious an injury of the pelvis and bladder, urine passing out from both openings of the wound, followed by good recovery.

VESICO-RECTAL FISTULA.

CASE CXL. — *Communication between the Bladder and Rectum, resulting probably from Ulceration.* — Dec. 12, 1864, a man about 35 years of age consulted me on account of the following diseased condition of the bladder, which I put on record on account of its rarity. He said, that, for a month, he had passed no urine, but only a white, milky fluid, per anum, in quantity of about a table-spoonful, when he strained at stool. On farther questioning, however, I found that, three times a day, he was in the habit of going to the water-closet, and discharging from the rectum a large quantity of fluid, followed by a solid operation. He said that he had suffered for the past two years from inflammation of the bladder, caused, as he supposed,

by assisting at the confinement of his wife, whom he held during the whole night, while she was struggling with the pains of labor. This he did much against his inclination. Ever since that time, he had difficulty in passing his water, which was discharged quite frequently, and mixed with mucus.

I passed an elastic catheter into the bladder, and drew off about half an ounce of fetid urine, mixed with pus: some blood followed the withdrawal of the instrument. A rectal examination disclosed nothing abnormal; but the finger could not reach high enough to detect the opening into the bladder. It was very evident, however, that the case was one of long-continued inflammation, with ulceration of the bladder, ending in perforation into the rectum. I forbear giving the treatment, as there was evidently but little to be done.

The patient was excessively pale and emaciated, and had the aspect of a man whose case would be likely to terminate unfavorably.

CANCER OF RECTUM. — CASE CXLI. — *Scirrhus Tumor of the Rectum and Bladder.* — A gentleman, 56 years old, consulted me, in 1849, on account of retention of urine. He was operated upon for the piles nineteen years before; and, at that time, a small hard tumor was discovered near the anus, which he declined having interfered with. Afterwards, he occasionally had attacks of pain in the bowels, and indigestion, but never any serious symptoms in the rectum. He always had diarrhœa.

An examination was attempted per anum; and it was found that the rectum was obstructed by a scirrhus mass, which prevented the introduction even of the little finger. The retention was gradually overcome by the use of the catheter, and the patient had moderately good health during the summer. The next fall, I was called to him on account of a second retention, which gave way to remedies, without the use of the catheter. It was, however, shortly followed by general anasarca; and he gradually sank, exhausted.

At the autopsy, the last four inches of the rectum were found pervaded by a scirrhus mass, leaving in the centre a narrow

pathway for the feces. The disease had extended to the bladder and urethra, and apparently implicated the middle lobe of the prostate gland, which projected into the bladder, and occupied about a third of its cavity.

Owing to the loose state of the bowels, the patient had been able to live nineteen years with this tumor, and had suffered but little inconvenience from it; and, in fact, was not made aware of its existence by any pain or other sensation, except an occasional irritation of the skin in the neighborhood, the result of the imperfect manner in which the evacuations were controlled.

The left kidney was in a high state of inflammation, and there was some purulent deposit in its pelvis: the ureter was not extraordinarily distended.

It might be stated, that, during the last week of his life, he refused food entirely, on account of the difficulty and pain in swallowing, caused by an inflammation in the fauces. Very severe hiccough ensued, which was mitigated, and the last part of his life made easy, by the occasional inhalation of ether.

CASE CXLII. — *Enormous Cancerous Disease of External Genital Organs. Removal.* — A laborer, aged 36 years, entered the Hospital in May, 1865. Three years previously he had an ulcer on the penis, which was soon followed by inflammation of the left testicle. He received no treatment until October, 1864, when the diseased testicle having attained great size, was removed by some surgeon in the southern portion of the country.

In about a month after this operation, a hard, gray-colored tumor formed within the lips of the wound. This was cauterized, but continued to increase in size rapidly. It presented the appearance of an irregular mass, about the size of a very large tomato, being at least ten inches in circumference, having a granular, fungous appearance. It enveloped the left side of the scrotum and the pubes, and implicated the penis. There was a fetid discharge, and occasionally hemorrhage, but never much pain. His mother had, at the time of her death, a "rose cancer." He desired an operation, although informed that it would be only palliative.

May 10, 1865, he was etherized. A ligature was first passed through that portion of the tumor situated above the pubes, and drawn up firmly. The remainder of the tumor was then dissected and torn from its adhesions, and caustic potash applied to the base. Several bleeding vessels were tied, and the edges of the wound were brought together with sutures.

This was a most desperate case of disease, in which hardly any operation seemed available: the diseased mass was almost a foot in circumference, and the integuments of two-thirds of the penis implicated. The mass in the groin, in the course of the spermatic cord, descended so deeply that the only fair way of controlling the hemorrhage seemed to be to enclose the whole base of the growth in a ligature. The patient left the Hospital in about four weeks after the operation with a wound of the size of a dollar, and able to move about freely and to pursue his ordinary avocations. The relief from the dreadful stench of the ulcerated mass, even if but temporary, was enough to repay him for the operation. Before it he was completely disabled. The disease returned subsequently internally, and destroyed him.

INDURATED TUMOR OF PENIS.

Indurated Tumor of Penis.—I have four or five times met with a very peculiar disease of the cavernous texture of the penis, which I have not seen described in any book until recently. It has generally appeared in the upper part of the fibrous covering of the corpora cavernosa at the root of the penis, and so perfectly defined, flat, and firm, as to seem like a foreign body implanted in the substance of the organ. Its edges were quite regular, with sharply defined corners, like a bit of broken crockery. The disease has usually appeared slowly, increased gradually till the induration has arrived at about the size of a ten-cent piece or somewhat larger, and then remained stationary. It has not been productive of much pain; and the principal effect has been to produce an increased curve of the penis towards the pubes, with a degree of tension and uneasiness during erection. In one instance,—that of a gentleman about forty years of age,—the induration was lim-

ited to one side, and caused a deviation of the organ in that direction, a greater source of inconvenience than in the position stated above.

The tumor is entirely free from acute inflammatory action, and is unlike the induration caused by the rupture of the cavernous tissue, which occurs in the course of venereal disease. This is particularly the case in the inflammation from gonorrhœa, which is limited to the under part or one of the sides of the penis, and sometimes terminates in suppuration.

The treatment adopted consisted principally in management of the diet, abstinence from all excitement of the sexual organs, and in the local application of mercurial ointment by inunction; also in the use of an ointment of the iodide of potash, and occasionally of leeches. These remedies, especially the mercurial ointment, have seemed to have the effect of arresting the disease, or producing a slight diminution of it, but in only one instance causing the entire disappearance of the tumor: so that I have almost been led to the conclusion that there may be a slight deposit of calcareous matter in it. In none of the cases met with has an operation seemed to be necessary.

Having made a statement of the above facts to the Boston Society for Medical Improvement, about ten or fifteen years since, for the purpose of eliciting information, my attention was drawn, by a medical gentleman, to a paper published in the "London Lancet," about that time, giving a number of cases, but attributing the origin of the disease to former venereal affections; at least, in most of the cases adduced, the patients had been more or less addicted, in the course of their lives, to sexual irregularities.

This disease is also noticed by Dr. Gross in his "Surgery," published in 1859, where he refers to a case of indurated tumor, in the pectiniform septum, removed by an operation.

CASE CXLIII. — *Indurated Tumor of Penis.* — A gentleman 56 years of age, well-formed and in good health, with the exception of a prolapsus of the anus, applied to me on account of a trouble in the penis. He said that, during erection, the glans crooked backwards on the dorsum; also, that the sexual

powers were much diminished. On examination, I found at the back and root of the penis, partly hidden by the skin, an induration situated in the corpora cavernosa, extending quite across, and of a depth of about an inch. It felt almost like a bit of wood under the fibrous sheath of the penis. He said that it had existed about two years, gradually extending from behind forwards. There was no pain in it, nor sensation on handling it. I could not discover any symptom of trouble in the urethra, prostate, bladder, or kidneys.

I advised him to use a cold enema daily for the prolapsus, to rub the tumor with an ointment of the submuriate of mercury and the iodide of potassium, to avoid excitement of the organs, to use no stimulant, and restrict himself principally to a vegetable diet; also to take internally the iodide of potassium, three grains, twice a day. Under this treatment, the tumor slowly decreased in size, but did not disappear entirely.

CASE CXLIV.—*Indurated Tumor in the Penis.*—In the previous case, the induration was situated on the dorsum of the penis, near its root, and in the immediate vicinity of the pubes. In the present instance, it was situated near the extremity of the organ, and in close proximity to the glans. The gentleman was advanced in life, somewhat gouty or rheumatic of habit, had been troubled with sciatica, and at one time dyspeptic. He had never suffered from any form of venereal disease. When I saw him, he was in a very good state of health. His attention was first drawn to this affection, from his penis becoming distorted during erection, being turned a little to one side. This was attended with a slight degree of uneasiness, and with an unnatural hardness of the organ at the point indicated. On examination, I found on the back of the penis, near the glans, and somewhat to the left side, a distinctly marked induration, which felt almost like a foreign body, situated beneath the skin, in the fibrous tissue of the corpus cavernosum. It was quite angular; and, when seized with the fingers, was found to be partially movable in the surrounding parts. There was no appearance of inflammation, nor any tenderness on pressure. I advised him to apply, twice a day,

mercurial ointment over the induration, first bathing the part with warm water. This course was followed for about a month, when the use of the ointment was suspended on account of a slight irritation of the skin. This soon subsided, and an ointment of iodide of potassium was substituted for the mercurial ointment. He was also advised to take no wine, and not to ride on horseback, both of which he was in the habit of doing. It may be stated that there was no disease of the urinary organs. The patient followed this course for about a year, suspending, from time to time, the use of remedies, for eight or ten days together. He used, for the most part, the ointment of iodide of potassium, rarely the mercurial. The disease gradually yielded to a certain extent, the sharp outline of the induration disappearing, leaving only an undefined hardness, which was rather difficult to detect. At this period, I advised him to suspend treatment, but to follow out the precautions which I had pointed out. The unpleasant symptoms which at first attended the disease had disappeared.

The history of this case is very similar to that of others, — the mitigation of the symptoms under treatment; but in nearly all there was still a persistence of some induration, in spite of remedies. I have never seen it assume a malignant form, the fear of which patients generally have in their minds, nor could any of the cases be traced to a venereal origin.

Since writing the above, the patient consulted me for another affection; and I found that the induration had completely disappeared.

TUMORS OF SPERMATIC CORD.—CASE CXLV.—*Adipose Tumors of the Spermatic Cord. Removal. Recovery.*—November, 1849. A married man, 56 years old, twenty years before produced an inguinal hernia on the right side, by a strain. It was of the size of chestnut, and easily reducible. He had always been liable to the recurrence of the hernia since, and wore a truss.

In 1837, he perceived a small swelling, or tumor, at the lower part of the scrotum, of a globular form, hard, movable, not tender. The testicle, he thought, could be felt below. This

tumor increased until it had attained the size of an orange, and then ceased to enlarge.

Nine years after the appearance of the first tumor, a second one was detected above it; and three others have since been discovered. He had been examined by a number of surgeons, and the tumor variously pronounced to be a hydrocele, disease of the testicle, omental hernia, &c.

On examination, it presented the following appearances: The scrotum was the size of a child's head at birth, the increase being evidently on the right side. It contained, apparently, several tumors, more or less connected. One, at the lower part, of the size of the testicle, and in which pressure caused the peculiar pain produced by injury to that organ; above this, a tumor of the size of an orange, quite hard and insensible; still higher, two large and two small tumors, the latter being in the vicinity of the inguinal ring. An indistinct feeling of fluctuation pervaded the whole of the mass, which was pressed up against the orifice of the inguinal canal, and completely covered it.

On dragging it down, and embracing the integuments between the thumb and forefinger, the spermatic cord could be distinctly perceived passing out from the ring; but, on the most careful examination, no prolongation of the tumor into the abdomen was discovered. On causing the patient to cough, a portion of intestine was felt to force itself down into the scrotum, and immediately recede. The question of diagnosis seemed to regard: 1st, An omental hernia; 2d, A disease of the testicle; 3d, Some tumor of rare occurrence.

The objection to the former was, that there seemed to be no connection between the tumor and the abdomen; and, although it is known, that, in some cases, from the effects of pressure, the connection in old omental hernia with the abdominal cavity is cut off, this is not of very frequent occurrence. To the supposition of its being a diseased testicle, the small tumor at the lower part of the scrotum, of the apparent size and sensibility of that organ, could be objected. My own impressions were in favor of the third view of the case, and therefore I advised him to have an exploratory incision made; and, if it was found that

the operation could not be terminated without great risk to life, that the wound should be closed without proceeding further.

This being consented to, the patient was etherized, and an incision made through the integuments of the scrotum, exposing the middle lobe of the tumor; but the diagnosis was not elucidated by cutting into this. The lower lobe was then removed; the testicle being incorporated in it, apparently healthy, though smaller than natural. In the dissection of the remaining tumors, nearer the inguinal ring, the hernial sac was unavoidably cut into, being intimately connected with them. No intestine appeared, careful compression being made on the inguinal canal during this latter part of the operation.

The recovery was perfect, after a smart attack of constitutional irritation; the inguinal ring being plugged by the remains of the inflamed and thickened sac.

The tumors, on careful examination, were found to have a fatty structure, and embraced the spermatic cord, — the vas deferens being traced, in its whole length, passing through the centre of the mass.

One or two instances of similar tumors are given by authorities, but none apparently of so large a size.

PHIMOSIS.

The operation for phimosis has been variously performed. The common method is to pull forward the skin, press back the glans, and then remove a circular piece from the end of the prepuce. On letting go the part, the skin recedes, leaving the mucous membrane still constricted, and often with a ring of integument attached to it. This is slit up longitudinally on the upper side, and the edges of the skin and mucous membrane brought together by a series of sutures placed around the whole circumference of the organ. The old method consisted in simply slitting up the prepuce upon its dorsal aspect, and allowing the integument to recede on either side. This operation, in many cases, answers the purpose, although it leaves a rather unseemly flap of loose skin. The operation first described, in some cases, does perfectly well; but, almost always, there is

an excessively sore spot at the point where the frænum is divided, taking a long time to heal, and attended by much irritation. All the benefits of the operation may be secured by the following procedure. The front or dorsal part of the prepuce is seized by forceps, placed obliquely upon it, so as to take up a triangular portion of the tissues, covering the glans; the skin behind, or that continuous with the frænum, being left ungrasped by the jaws of the instrument. The portion protruding beyond the forceps is cut away with scissors. The same end may be attained by making the skin tense, by introducing one blade of the forceps inside the prepuce and the other outside, and removing an apron-like portion in front; care being taken to divide the mucous membrane well down towards the base of the glans, as a failure in this part of the operation is one of the most fertile sources of strangulation. The edges of the wound are then nicely adjusted by means of many sutures taken very near the margin. It will be understood, that, in this latter operation, the skin behind is not interfered with.

The effect of phimosis is to act as a place of deposit for contagious secretions. In many cases which I have seen, in young persons, it has appeared also to have retarded the growth of the organ. In children, we often find the prepuce adherent to the glans, sometimes so firmly as to render it impossible to destroy the adhesions; in which case, there is nothing to be done but to cut the skin, and draw it backwards. Generally, however, after slitting up the prepuce in front, the mucous surfaces can be easily separated from each other by means of a probe.

HYDROCELE.

I shall allude to this common disease very briefly. The favorite treatment of late years has been by the injection of tincture of iodine. A drachm of the tincture, or, what is perhaps better, the compound tincture, of iodine, as it does not precipitate, diluted with three parts of water, is thrown into the sac, and left there. This treatment is, however, very uncertain. I have tried the seton, but have seen much inflammation produced by it; and in one case, hemorrhage, from the ulceration

caused by it, cutting off a good-sized vessel. Incision is apt to be followed by suppurative inflammation and a tedious convalescence. In one or two instances in which I have lately practised it after other means had failed, I found, attached to the testicle, numerous cystic growths containing spermatozoa, which Mr. Curling describes as having found in an encysted hydrocele attached to the epididymis. As a general rule, I have found that the wealthier classes in life prefer the palliative operation of tapping. The laboring classes, who are more inconvenienced by it in their vocations, prefer the radical cure. Before operating, it is always necessary to look for the translucency of the tumor, by sunlight if possible. The operation of tapping is best done with a small trocar, thrust in quickly; the point being directed obliquely upwards, as the testicle is usually at the back part of the scrotum.

HÆMATOCELE.

CASE CXLVI. — *Hæmatocele. Extirpation of Testicle.* — This patient had carried a tumor, of unknown origin, for nineteen years. When seen, it was of the size of a cocoa-nut; firm, without fluctuation, and presenting an inflamed spot upon its anterior aspect. Being considered a tumor of the testicle, its extirpation was advised and practised. The sac, which was not punctured during the operation, was subsequently laid open, and gave issue to a dirty-colored fluid. The testicle, after the removal, was found flattened and wasted on the posterior face of the sac. The tunica vaginalis was thickened to nearly a quarter of an inch, its interior lined with coagulated lymph, and distended so much as to hold a pint. The recovery was perfect in two weeks; and, although there was a mistake in the diagnosis, the operation performed was the best for the patient, as the process of granulation, in so thickened a sac, must necessarily have been very tardy, and the testicle was no longer of any efficiency.

The difficulty of diagnosis was increased by the enlargement of the other testicle, which had within a year attained double its natural size, was much flattened, and evidently had no

water external to it. Both the patient and his physician insisted that the disease of the other testicle commenced in the same manner; and the latter stated that he had often examined it with the view of detecting fluid in the tunica vaginalis, but never could discern any.

CASE CXLVII. — *Case of Hæmatocele, resembling Disease of the Testis. Removal.*—In May, 1865, the following case of difficult diagnosis came under my care at the Hospital.

The patient was a colored man, about 35 years old, of large powerful build, belonging to the navy. Seventeen years before, he had received a blow upon the testicle from the fall of a powder box. The testicle swelled until it was twice as large as natural, and afterwards did not diminish in size. In March, 1865, he had an attack of intermittent fever, attended with great swelling of the testicle, and excessive pain in it. The pain was so great when he entered the Hospital, that he hoped to have the testicle removed the same day. For the farther investigation of the case, however, I decided to place him under treatment for a short time. He was put in bed, on a light diet, and large laudanum poultices were kept constantly applied to the scrotum: opiates were given at night. Under this treatment, in three days, great improvement took place; the pain was much relieved; and it was possible to handle the organ. On examination of the parts, the cord was found quite healthy; the tumor of the scrotum was nearly globular in form, smooth and elastic, such as might be presented by a greatly enlarged testicle; no feeling of fluid could be detected. The skin moved freely over all the tumor, except at the back part, where there seemed to be a projection from the main mass of a different character; the skin here being adherent, and the subjacent tissue giving a pasty sensation to the finger.

Being in doubt as to the nature of the disease, I informed him, that, after exposing the surface of the tumor, I should explore it before proceeding to extirpation. He was therefore etherized, and an incision made in the scrotum, over the front part of the tumor. A second incision, at the lower part of the scrotum, exposed a small portion of the healthy structure of the

testicle. An incision was then made deep into the tumor above, by which a sac, nearly three-quarters of an inch in thickness, was opened, giving vent to a little bloody fluid. A fibrinous mass was found in the sac. The case was at once shown to be one of old hæmatocele, and its removal was proceeded with. The projection behind was a cyst filled with fluid, which had been the seat of recent inflammatory action. The skin of the scrotum was here so adherent, that it was removed with the tumor. The testicle, as in the preceding case, was much diminished in size, and so displaced and compressed that its functions must have been entirely suspended. The left scrotal cavity was the seat of a hydrocele, which, however, was of recent development, and probably dependent upon the acute attack of the other side.

VARICOCELE.

Many methods have been suggested for the cure of *varicocele*, or enlargement of the spermatic veins. Breschet's method, with the screw-clamp, is almost insupportably painful; while that of Ricord, which is now perhaps the favorite one, consists simply in cutting across the packet of veins with a ligature. I have tried both these plans, as well as that by removing a portion of the scrotum; or, in cases where it has been much elongated, by producing adhesions of its sides by means of sutures.

The following operation for the relief of *varicocele*, which I have successfully performed in from sixty to seventy cases, and which is I believe peculiar, seems to me to be the simplest and most effectual. The vas deferens is first separated from the vascular part of the cord, and is kept out of the way by an assistant. A longitudinal incision of about two inches in length is next made in the scrotum down upon the bundle of veins, which is then seized with the forceps, drawn out, and, by a few touches of the knife, separated from the adhering tissues. Two strong ligatures are now passed above and below the mass of enlarged veins, and firmly tied, so as to include between them as much of the diseased tissue as possible. The strangulated veins, which at once shrink into a very small compass, are now

allowed to recede into the wound, which, by the contraction of the scrotum, becomes reduced to a comparatively small size. The patient is confined to his bed, and water-dressings applied during the separation of the slough, which takes place in from ten to fourteen days. In several cases, where the scrotum has been elongated to double its natural length, and filled with large masses of veins, which would almost seem to defy any mode of treatment, I have operated by this method with perfect success, and have seen the scrotum contract within a few weeks, or at most a few months, to its normal size.

I have never seen varicocele except on the left side of the scrotum.

CASE CXLVIII. — *Varicocele of Great Size. Operation. Recovery.* — A young man, 22 years of age, for ten years had more or less of a tumor in the scrotum. Finally, it became so large and cumbersome, and attended with so much pain in the loins, that he consulted me for relief. The scrotum, when the veins were fully distended, hung half way down the thigh. The left testicle was atrophied; and its vas deferens, when separated from the rest of the spermatic cord, was but half the size of the other. The testicle was so enveloped in the enlarged and thickened veins, that I feared it would be difficult to remove the latter, without the former being dragged out with them. I therefore informed the patient that this might take place, as it had once before occurred to me in a similar instance, which made it necessary to remove the whole mass. He agreed to have done what was thought expedient. Being etherized, and the vas deferens held out of the way by an assistant, the veins were exposed as high up as possible, for fear of encroaching on the tunica vaginalis; and a loop of them being drawn out, assisted by a few strokes of the bistoury, a double ligature was passed under, and tied above and below. The scrotum being too long, a large piece of it was excised. The whole wound, with the exception of where the ligatures and tumor formed by the tied-up veins protruded, was closed by sutures. A cold-water compress was placed over the wound.

A considerable amount of inflammation followed this com-

plicated operation. At the end of four days, the sutures were withdrawn, and most of the slough of the veins cut off. The wound was dressed with a poultice. An abscess formed low down at the back of the scrotum, and required the bistoury. After this, he gradually recovered; and left the Hospital in three weeks, with a small, healthy, granulating wound. The scrotum, from the size of an orange, was reduced to that of an egg.

I saw him, some months afterwards, entirely free from disease, and relieved of pain.

CASE CXLIX.—*Varicocele and Hydrocele. Operation. Recovery.*—June, 1860.—A man 60 years of age had, for a long time, been afflicted with a varicocele and hydrocele of the left side of the scrotum. It caused him pain in his back, from the dragging on the cord. Being etherized, an incision was made over the cord; the veins were drawn out, and tied in the usual manner. At the same time, a slight opening was made into the tunica vaginalis, and the serum evacuated. The patient did well for two or three days, when he was attacked by gangrene, which then, for the first time since the organization of the Hospital, pervaded the house, on account of the filling-up, with bad material, of the flats in the neighborhood. A large bit of the scrotum sloughed, and an abscess formed behind, which required evacuation. A yeast poultice was applied, and the patient put upon quinine and stimulants. At the end of a month, he was well enough to leave the Hospital; and, a month afterwards, he called on me perfectly well, the varicocele and hydrocele being both cured.

CASE CL.—*Varicocele. Operation. Recovery.*—A soldier, 36 years of age, entered the Hospital, Oct. 10, 1864, for a large varicocele in the left side of the scrotum, which had troubled him for many years, but had been aggravated by the performance of military duty, during four months, and finally caused his discharge from the army.

On the 12th of October, the veins being exposed by an incision, in the manner described above, a long, curved needle, armed with a double ligature, was passed between them and the

vas deferens. The loop of the ligature being cut, and the veins pulled out as far as possible, the ligatures were tied above and below, so as to include a large mass of vessels. The whole was then pushed back into the scrotum, and water-dressings applied. On the 27th of October, part of the ligatures were removed with the forceps; and, on the 29th, the rest came away. Oct. 31st, he left the Hospital well.

RETAINED TESTICLE.

CASE CLI. — *Testicle retained in the Groin. Removal. Subsequent Death of the Patient from Internal Disease, apparently Malignant.* — A gentleman, 38 years of age, consulted me in February, 1856, on account of his right testicle, which had never descended into the scrotum, but had been retained in the inguinal canal. For many years, this was no inconvenience to him; but, just before he saw me, it had been quite tender, giving him extreme pain on the slightest pressure, extending upwards into the abdomen, and down the thigh. As no treatment gave relief, I performed the operation of removal.

He was in poor health, and quite nervous, but with no apparent malignant disease. He was etherized with chloric ether, and the dissection conducted with the utmost caution, for fear of infringing on the abdominal cavity. The testicle was removed, with the tunica vaginalis, which closely embraced, and in some places strongly adhered to it.

On cutting into the testicle, the structure was found to be completely disorganized: the upper part of its body presenting the aspect of an unripe apple; in the lower was a cyst filled with a jelly-like material. Under the microscope, some nucleated cells were seen.

This gentleman recovered from the operation; but died suddenly a year afterwards, having suffered for some time previously with obscure symptoms of internal disease.

In two other cases of testicle retained in the groin, which I have witnessed, the organ was invaded by encephaloid disease.

FEMALE GENITO-URINARY ORGANS.

RUPTURE OF PERINÆUM.

CASE CLII. — *Rupture of the Perinæum. Operation. Cure.* — I was requested, in October, 1859, to see a lady, 35 years of age, who, five years before, had received a severe laceration of the perinæum, implicating the rectum about an inch and a half. The effect was complete incontinence of the feces, causing constant annoyance and suffering.

The patient, being fully etherized, was operated upon on Monday, Oct. 18th, in the following manner, the position being the same as for lithotomy: The lacerated edges of the rectum were first made raw, and a quadrangular bit of integument removed on each side of the fissure, about three-fourths of an inch wide, and an inch and a half long. The edges of the rectum were then brought together by three sutures, which were cut off close. Three deep sutures were inserted, with strong double thread, commencing about half an inch from the borders of the wound, and traversing its entire depth. These threads, being secured over bits of bougie, were made tight, and brought the edges of the wound well up together. Five superficial stitches were now passed, to adapt more perfectly the edges of the skin; and one within the vagina, to bring together the deep part of the wound. This being done, the finger was introduced into the rectum, to ascertain what resistance was likely to be made by the sphincter ani. This, which before the operation could not be distinguished, was now quite prominent, and could be hooked up by the finger, like a broad cord or ribbon. An incision was therefore made through the integument at the margin of the anus, the muscle exposed, and freely and carefully divided on the finger, by the scissors, without cutting through the mucous membrane of the rectum. The anus, which before this division was closed, now remained loose and open. A bit of lint was placed over the wound of the perinæum, and fixed in place by collodion, so as to serve as

a protection from the contact of the urine. The patient was then placed on her side, and a large catheter with a shield to it introduced into the urethra, the end of which afterwards was attached to a bit of gutta-percha tube, which conducted the urine into a male urinal provided for the purpose. On recovering from the ether, she had thirty drops of laudanum administered to her, chiefly for the purpose of checking the action of the bowels. The operation lasted an hour and a half, notwithstanding all expedition was employed.

She passed a quiet night, and felt no pain in the wound. The catheter, causing some irritation, was withdrawn, and afterwards was introduced twice a day, with the gutta-percha tube attached, to prevent any contact of the urine with the edges of the wound; and subsequently an ordinary female catheter of much smaller size, with a gutta-percha tube attached, was employed. Her nourishment was principally a bit of cracker, with a little brandy and water, two or three times a day, which she preferred to the juice of meat.

On the fifth day after the operation, the wound becoming sore, and the sutures more or less loose, the quill sutures were removed, leaving the superficial ones. She had had no evacuation, but had been somewhat troubled with flatus. The water was drawn off twice a day with the catheter, and the wound kept clean by constant bathing with warm water, and subsequent protection by a little cerate, rubbed on with the finger.

By the tenth day, all the sutures of the rectum, skin, and vagina were removed; and there seemed to be a good solid union, with the exception of a very small aperture between the rectum and vagina, which still remained open, but granulating.

On the twelfth day from the operation, she had a very large evacuation from the bowels, aided by an enema of warm water. This was effected without doing any damage to the union of the wound; and, on the following day, she began to pass her water without the use of the catheter, sat up, took food more freely, and was considered convalescent.

On Nov. 5th, I made a final examination of her case. The aperture in the rectum was closed, so far as could be de-

terminated from inspection of the part by the speculum ani, and disclosed no fluid passing from the rectum into the vagina. The perinæum was strong, thick, and firm, longer than is usually perceived in a woman who has borne children. The union was so good that traces of the operation were scarcely perceptible. The patient had full control of her evacuations for the first time in five years; and her stomach, though a little dyspeptic, was in better condition than it had been for a good part of that time.

The division of the sphincter ani, and the use of collodion to protect the external wound from the action of the urine, were, I think, of great advantage in producing a favorable result. The removal of the urine twice daily, by the catheter, with a gum-elastic tube attached, was also of great utility. A little urine only once accidentally came in contact with the wound, and was immediately followed by much irritation. This can be prevented, when the catheter is removed, by pinching up the gum-elastic, retaining the urine in the instrument until it is carried to the utensil.

I have gone into some detail in this case, as I have felt better satisfied with the management of it than of any that has come under my observation. The use of a small glass or ivory rod, in place of a bougie, would, I think, be of advantage, as less likely to retain irritating matter. In using the quilled suture, I took great pains not to draw the stitches tighter than was absolutely necessary to bring together the deep part of the wound, from fear of producing partial strangulation, and consequent unhealthy inflammation in the intermediate integument, — an accident of not uncommon occurrence, as appears by recorded cases. The introduction of a stitch within the vagina was of much use in facilitating the union.

CASE CLIII. — *Rupture of the Perinæum. Operation. Cure.* — This case is condensed from the Hospital records. In the spring of 1864, a young woman, 20 years of age, was admitted to the Hospital, on account of rupture of the perinæum. She stated that, four years before, she had been delivered of a male child, by a midwife, after a labor of forty-eight hours. When

she left her bed, it was discovered that the perinæum was ruptured. She was able to retain her feces, except when they were very liquid. She always had pain at evacuations.

She was etherized, and placed in the position for lithotomy. There was found to be a partial prolapse of the uterus. The rupture of the perinæum involved only a part of the sphincter ani, leaving the recto-vaginal septum entire. A V-shaped incision was made through the integument along the furrows just outside of the external labia. That portion of skin which lay near the anus was dissected up, and the dissection carried backwards for a distance of three-quarters of an inch upon the upper surface of the sphincter. The dissection was continued inwards, in the line of the V-shaped incision, so as to obtain a raw surface. Thus, flaps were obtained, the edges and raw surfaces of which could be easily approximated. Silk sutures were passed through these flaps, about half an inch from the free edges, and secured over pieces of bougie, accurately adjusted on each side of the wound. The pressure thus exerted was in a line with the points where the sutures were introduced. The edges of the flaps were held together by means of interrupted silk sutures. The laceration was thus closed without any tendency towards outward traction, since no portion of the integument of the nates was involved in the operation.

Direction was given to pass the catheter as often as should be necessary, and not to allow any urine to fall upon the wound. A simple cold-water dressing was applied.

On the sixth day after the operation, an examination was made, and it was found that there was the usual suppuration about the sutures. All the sutures, except one near the anus, were removed. There was firm union without any tension. Subsequently, cicatrization was complete; and, on the eighteenth day, she was discharged from the Hospital, cured.

CASE CLIV.—*Rupture of the Perinæum and Recto-vaginal Septum. Operation. Recovery.*—A lady 30 years old, of ordinary good health, who applied to me, was confined, two years before, with her first child, having been forty-eight hours in labor. The head of the child was dropsical, and nearly

double the natural size. As it passed the external organs, the rupture occurred, which, however, was not detected until the next day. Her physician, suspecting a laceration, made an examination, and introduced two stitches, which were ineffectual in producing union. From that time, she had not been able to retain the contents of the bowels, which, unlike the previous case, were constipated instead of being relaxed. About six months before I saw her, having stood a long time in a crowd, occasionally on tiptoe, she was taken with a sense of distress and weight in the pelvis; and it was found that a prolapsus of the uterus had taken place. This was an additional source of trouble to her, obliging her to wear a sponge for support, and to use astringent injections.

The operation was done much as described in the previous case. The hair being shaved, a surface three-quarters of an inch wide was exposed on each side of the laceration. The sides of the deep fissure in the recto-vaginal septum were dissected up (separating the rectum from the vagina), their edges freshened and brought together by stitches. The perinæum was brought together by the quilled suture, three stitches being used, and the edges of the skin approximated nicely by means of four sutures with fine thread. The sphincter ani was divided on the left side as follows: The finger was introduced into the rectum, and the muscle hooked up upon it. A small aperture was made on the margin of the mucous membrane, distinctly exposing the muscular fibres: these were divided with a small pair of blunt-pointed scissors, down to the mucous membrane of the rectum, held on the finger. The anus now remained perfectly open and relaxed, and without the slightest traction on the stitches holding it in front. The operation lasted half an hour, the patient being fully under ether. She was placed in bed, on her side, and the nurse directed to draw off the water with a catheter having an elastic tube attached to it, three times in the twenty-four hours, and on no account to allow any urine to touch the wound.

Four days after the operation, I removed the back-stitch which held the quill, as suppuration had taken place around it, causing some pain and irritation about the anus. In other

respects, every thing did well, and the patient experienced no constitutional disturbance. The stitches in the skin were also cut and withdrawn, and the union appeared good. She took bread, tea, and broth for nourishment. Her recovery was perfect.

VESICO-VAGINAL FISTULA.

The treatment of this affection, which had, until very recently, been almost wholly confined to the simplest cases, has been lately revived in this country with remarkable success, especially since the publication, by Dr. Sims of New York, of a number of very successful cases, in which he attributed the good result to the employment of sutures of silver wire; but a more extended trial has failed to demonstrate that superiority which was claimed for them over silk or linen threads, and the greater inconvenience which attends their employment has already led to their abandonment by some surgeons.

In quite a large number of operations which I have performed for vesico and urethro vaginal fistula, I have always used sutures of common surgeon's silk, and have had every reason to be satisfied with the results.

The real improvement in this operation, and that which has been the means of bringing it into so general use, is the very free dissection of the vaginal mucous membrane from the old cicatricial tissue, and from the walls of the bladder: by this plan, the stitches are effectually relieved from tension, and the results are generally favorable.

In many cases of this disease, we find the os uteri, and sometimes the upper part of the vagina, completely obliterated; causing retention of the menstrual fluid. I have watched a number of cases of this kind, and have always observed that relief is ultimately obtained, often after great suffering, by the formation of a fistulous opening communicating with the vagina, or, very rarely, with the bladder.

Few surgical diseases are more distressing to the patient than vesico-vaginal fistula, and no operation better rewards the skill of the surgeon. It rescues the sufferer from a state in which existence has become a burden, and restores her once more to the world and to the enjoyments of social life.

CASE CLV. — *Vesico-vaginal Fistula. Operation. Recovery.* — A woman 28 years of age, mother of three children, was in labor four days with her last child. All her children were born dead. She did not perceive the injury done to the bladder till she began to get up from her confinement, twelve days afterwards, when, on examination, it was discovered that nearly all the urine escaped through a large opening in the vagina. I first saw her in November, 1860. The aperture in the bladder extended from an inch behind the pubes to the os uteri, which was ragged and irregular, having been involved in the injury. She had menstruated twice since the accident, and was rather feeble. The skin of the inside of the thighs was irritated by the constant passage of urine over it. The operation was performed in November; the injury was received in the preceding February. She was placed on an elevated platform, constructed for this purpose, on her abdomen; the limbs being placed at right angles with the trunk. The mucous membrane having been freely dissected in the usual way, six sutures were introduced, and the whole wound brought nicely together: the button-suture, according to Boze-man's method, was not used on account of the great extent of the opening, otherwise it would have been employed. She was laid on her side, and a catheter with a gum-elastic tube attached to it introduced every four hours, to draw off the water, the tube being added to prevent any contact of urine with the external organs. This plan I have found preferable to leaving the catheter constantly in place, as it allows much more freedom to the patient. Every thing went on well until the end of a week, when, on account of the attendant's omitting to draw off the water, she passed the whole night with the bladder distended. This was followed by a leakage from the wound the next morning. In the course of the following week, all the sutures were removed; and, about the first of December, she left the Hospital, as she said, well, being able to retain her water about two hours. I saw her before she left town, on the 14th December. She had not menstruated since the operation; and I found it difficult to decide whether the opening from the uterus was into the bladder or vagina. Her

health, however, was good, and has remained so since. In a similar instance, the menstrual fluid passed into the bladder, and escaped from the urethra without inconvenience.

CASE CLVI. — *Vesico-vaginal Fistula. Cauterization. Relief. Phosphatic Calculus. Lithotrity. Relief.*—A woman, aged 32, entered the Hospital March 9, 1848. Fourteen weeks before, she was delivered, by forceps, of a dead child, after a labor of four days. During this period, she was for the greater part of the time insensible, from the effects of narcotics.

Two days after delivery, there was incontinence of urine, which flowed constantly from the vagina, never passing by the urethra, or collecting in the bladder.

She did not menstruate after her labor, nor did she have any difficulty at the period when the menstrual secretion should appear. There was, however, much milk in the breasts, but varying in amount: she had not noticed any relation between the quantity secreted and the catamenial period.

The external organs were found excoriated by the urine, which was constantly dribbling away. The vagina was somewhat contracted throughout its entire length, but more especially at about three inches from the vulva, where there was a very marked constriction. Behind this was a longitudinal slit, with callous edges, on the anterior wall of the vagina, through which water was seen issuing from the bladder. A small irregular opening existed in the posterior part of the vagina near the situation or in the place of the os uteri, which had entirely disappeared in the cicatrix.

She was thoroughly etherized with chloric ether, as it was found almost impossible to make the slightest examination, on account of the extreme sensibility of the parts. The speculum of Ricord was used both for the examination and the operation. The edges of the fistula were cauterized, so as to produce a slough, with the potassa cum calce, and a catheter introduced. This instrument, which had been made for the purpose, was half an inch in diameter, five inches long, with a shield an inch from its external orifice.

The patient suffered but little from the caustic, and no urine passed through the fistula for several days. It was touched occasionally with creosote; and, nine days after the operation, no urine having passed through it for some time, the catheter was omitted, and she was allowed to walk about.

A month later, she reported that no urine passed by the vagina. When the catheter was first omitted, the water dribbled away from the urethra, which from long disuse had apparently lost its power of retention. This power, however, was by degrees restored.

On May 7th an examination was made both by the vagina with a speculum, and by the bladder with a catheter. The fistulous opening was hardly perceptible. In the bladder was found a calculus, apparently about the size of a chestnut. With a lithotrite, the stone was easily caught and crushed. On the following day, the fragments of the stone came away with the urine. They were found to be composed of the phosphate of lime.

This patient remained in the Hospital until the latter part of May, when she had full command over the urine. During the whole of this time, there was no appearance of the menstrual secretion; but at stated periods, at an interval of four weeks, an increased secretion of milk took place in the breasts.

A year later, she called on me, and said that she had been well since leaving the Hospital. About three months before, nearly a year after her delivery, the catamenial function was restored, and remained regular. This must have had its exit at the orifice which took the place of the os uteri, and which undoubtedly when I first saw her was partially occluded.

On over distention of the bladder, a small quantity of urine was found to escape from the vagina. An examination with the speculum proved that the old fistula had closed, and that the urine must escape from the same fissure in the uterus as the catamenia, showing that a vesico-uterine fistula existed.

In quite a number of the cases of inflammation and sloughing of the vagina after tedious labor, which have occurred in my practice, the os uteri has become obliterated. The menstrual function, however, has not been suspended: having, in some

instances, found an exit through the bladder; in others, forcing its way into the vagina.

CASE CLVII. — *Vesico-vaginal Fistula. Operation. Cure. Retention of Menstrual Fluid for Nine Years. Spontaneous Rupture into Vagina.* — About the year 1846, I was called to see a woman, 25 years old, who had been delivered of a dead child, some weeks before, after a tedious labor. I found that the whole vaginal portion of the bladder had sloughed away, leaving but the superior, and a small portion of the lateral walls. There were besides large abscesses running into each groin from the vagina. After a preparatory treatment to restore her strength, she was operated on. The bladder was dissected away from the vagina as far as possible, and the edges of it, being pared, were brought together in the usual manner with silk sutures. The organ was then not more than one-half of its original size. The operation was followed by complete success.

By the previous inflammation, the os uteri had been entirely obliterated; and, at each subsequent menstrual period, she suffered dreadfully for a number of years. No uterine tumor could be detected, either by the abdomen or rectum. Nine years afterwards, during one of these monthly attacks, a rupture took place in the vagina, followed by the discharge of nearly two quarts of menstrual fluid. This was the only appearance of this secretion. I saw her in 1866, eleven years after the rupture, and found there had been no return of the discharge. There had been, however, until within three years, the usual premonitory symptoms of the catamenial flow, but nothing more. She was in good flesh and strength, but had suffered from disturbance in the stomach and head nearly all the time. She consulted me, when I last saw her, on account of profuse vomiting of a colorless fluid. The bladder had performed its functions normally since the operation. The destruction of tissue was more extensive, and the result of the operation more successful, than in any other case of this kind that I have had.

In another case, where the whole lower half of the bladder was lost by sloughing, the same symptoms were manifested

at the catamenial periods. At one of these periods, a year from their commencement, the pains became violent and forcing, as in labor. A rupture of some part of the uterus into the vagina took place; and the patient was, as she states, at once deluged with blood, so that long-continued fainting took place, from which she was with difficulty recovered. The menstrual function has since gone on regularly.

PROLAPSE OF THE WALLS OF VAGINA.

The following cases illustrate the prolapse, or hernia, of the bladder into the vagina, not a very common affection. It is usually caused by a straining effort, acting upon the relaxed walls of the vagina, and must be distinguished from prolapse of the mucous membrane of that passage, and from cystic tumors arising in its walls. When the tumor formed by the bladder is of large size, it is the source of great inconvenience in walking, and interferes with micturition.

CASE CLVIII. — *Prolapsus of the Bladder and Anterior Walls of the Vagina, simulating a Tumor.* — In September, 1863, a young woman, 25 years of age, consulted me in regard to a protrusion from the external organs, which interfered with locomotion. She had been married at seventeen, and was the mother of five children. The tumor was not noticed until after the birth of her last child. Her general health was good.

A large fold of the anterior wall of the vagina was found hanging down just within the labia. The os uteri was slightly enlarged; otherwise the uterus was normal. Elevating that organ had no effect upon the tumor. A catheter, passed into the bladder, could be made to enter the tumor, by reversing its beak.

I introduced a horseshoe pessary, with immediate relief, so that she was enabled to walk home, a greater distance than she had previously walked since her confinement. This exertion, however, caused a slight hemorrhage, so that I thought it best to remove the pessary after two days. Subsequently she learned to introduce it herself, and wore it with relief.

CASE CLIX. — *Prolapsus of the Bladder, simulating Cystic Tumor. Formation of a Fistula.* — In September, 1861, I was requested to see a lady, about 50 years of age, who was affected with a tumor in the vagina, resembling cystic tumor. It was first noticed several years before, after straining while lifting; recently it had caused inconvenience by its weight and the pain felt during micturition, which was frequent and difficult. I perceived, on examination, a large tumor, situated in front of the os uteri, which retracted on pressure, was flabby, and projected between the labia. Half an inch below the urethra was an ulceration, through which a catheter was passed into the cavity of the tumor, which proved to be the bladder. A sound could only be introduced through the urethra into the bladder when the latter was reduced to the normal position, not when prolapsed. Evidently, the obstruction to the passage of the urine through the urethra was the cause of the formation of a fistula. She was advised to wear a ring pessary, to keep the bladder in position.

CASE CLX. — UNCOMMON TUMOR OF THE MONS VENERIS. REMOVAL. CURE. — A lady, 42 years of age, noticed, soon after confinement, a tumor in the left groin. It gradually made its way into the labium of that side; and, as it enlarged, involved the mons veneris, dragging it down, together with the integuments of the abdomen, and finally formed a large pendulous tumor, hanging between the limbs, covering the external organs of generation, and causing much pain and inconvenience.

It was removed, and found to be fibro-cellular, of very firm consistence; the cellular tissue surrounding it, and entering into its composition, being infiltrated with serum. Its weight was two pounds and two ounces.

I learned, subsequently, that she was well, and had been safely delivered of a healthy child.

VASCULAR AND SENSITIVE TUMOR OF THE FEMALE
URETHRA.

A vascular tumor is not infrequently met with, just at the entrance to the urethra, in the female, having around its base, usually, a bright erythematous blush. It is composed of enlarged veins, and is classed by Paget among erectile growths. Mr. Hutchinson compares it to hemorrhoids. It is generally very sensitive, and is the source of great irritation, causing pain, itching, and smarting during micturition, often aggravated at night: occasionally it is the seat of hemorrhage.

Extirpation is the only remedy; and care must be taken to excise the whole morbid growth, and even then it is liable to recur. A valuable monograph has been written on this subject by Dr. Alexander E. Hosack of New York.

The following cases are illustrative of this affection: —

CASE CLXI. — *Sensitive Tumor of the Female Urethra.*
Excision. — The patient was a married woman, 64 years of age, never pregnant. She had had good health during early life, with the exception of dysmenorrhœa. Her catamenia ceased suddenly, when she was fifty-six years old; and four years subsequently she suffered from dysuria, attended with severe scalding: at night there was stinging pain in the region of the urethra, and pruritus during the day. The external genital organs, especially in the vicinity of the urethra, were excessively tender. These symptoms increased in severity up to June, 1863, when I first saw her.

I found a vascular excrescence, about the size of a pea, protruding from the urethra. On the 1st of July, the tumor was excised, with a circular portion of the mucous membrane around the orifice of the urethra, and the wound cauterized with nitrate of silver. A flexible catheter was then introduced into the bladder, and allowed to remain. She soon recovered, and was discharged well. The tumor, however, recurred some months after the operation, but gave much less trouble. It was removed as before, and I have not since heard that it returned.

CASE CLXII. — *Sensitive Tumor of Female Urethra. Excision. Complete Relief.* — A young woman, 26 years old, of dark hair and complexion, had for four years been troubled in micturition. The affection, however, had not assumed a very severe form until a month before her first visit to me. Every passage of water, at this time, was attended by a burning, stinging sensation, which was almost insupportable, and finally became so severe as to affect her health. With the usual delicacy which women feel in complaints of this nature, she had avoided consulting her physician; and it was only by the advice of her sister, who had been a nurse, that she was finally persuaded to apply to me. At this time, the mere contact of the clothes was insupportable, and she had had one or two attacks of rather profuse bleeding from the neighborhood of the urethra. On examination, a vascular tumor was found, of the size of a very small pea, projecting from the urethra, the mucous membrane at its base being highly injected. The tumor, and the surrounding parts, were exquisitely painful to the touch. The patient being fully etherized, the tumor was seized with forceps, dragged out, and as large a portion as possible of the mucous membrane excised. The operation was followed by complete relief; being the first case that I have met with where a cure has resulted from a single operation; most of the cases having been attacked by caustics or the knife before coming under my observation.

CASE CLXIII. — *Sensitive Tumor of Female Urethra. Excision. Relief. Recurrence of Tumor at the End of Ten Years. Excision. Relief.* — A lady, 38 years of age, had been troubled for nine years with great dysuria, and excessive sensitiveness of the parts in the neighborhood of the urethra, so that she could not bear even the contact of her clothes. Before consulting me, cauterization had been employed; without giving her any relief, however.

I found a small vascular tumor projecting from the orifice of the urethra, bleeding on the slightest touch, and so painful as to elicit loud outcries from the patient on the most delicate examination. She was etherized, and the mucous membrane of

the urethra everted to as great an extent as possible with the forceps, and excised. The hemorrhage during the operation was quite profuse.

Relief followed for nearly ten years, when the tumor reappeared, but with less violent symptoms than before. It was treated in the same manner as at first, and with as good result.

I have not heard of its recurrence.

CANCER OF VULVA.

I have been much struck with the great relief afforded to patients with extensive and painful cancerous affections of the vulva by a surgical operation. Females are very apt to conceal the disease until its ravages have made great progress, when, from the amount of discharge, the difficulty of locomotion, and often a painful secondary tumor, they are obliged to make it known. In a number of cases, I have removed a cancer occupying the entire labium, extending up into the floor of the vagina, and penetrating the urethra above. The wound healed rapidly after the operation; and the patients, so far as I know, have done well. The cancer is without doubt epithelial, and in my opinion amenable to operation. In the instances in which I have practised removal, there has been no recurrence of the disease, although some of them were of the most formidable character.

In the case of an old lady, who was suffering excessively from a very extensive cancer of the labia and a large secondary tumor of the groin, — in whom locomotion was entirely prevented, and the discharge so acrid as to excoriate the surrounding parts over which in addition the urine passed, — I performed an operation, removing the whole diseased portion of the pudenda; and the patient recovered the use of her limbs. The tumor of the groin was not interfered with.

CASE CLXIV. — *Cancer of Vulva. Operation. Recovery.* — An unmarried woman, 36 years old, entered the Hospital in March, 1865, for an ulcerated cancer, occupying the whole extent of the left external labium, also the upper por-

tion of right labium, implicating the vulva, and extending quite deeply beneath the surface. It began, a year before, by a hard nodulated swelling on the left labium, causing, at first, no inconvenience. January, 1865, it discharged freely, and also was quite painful. Soon after this, hard globular swellings appeared in the left groin. On the 30th of March, an operation was performed, to remove the entire disease of labia and vulva. It was thought useless to attempt to remove the glands in the groin, the induration at their bases being very indefinite. When the erectile tissue was cut into, the hemorrhage was pretty free, and many large vessels required to be tied, — which is generally the case in this operation. A few days afterwards, an erysipelatous inflammation occurred in the tumors in the groin, requiring free incisions. Sloughing took place, terminating in the complete destruction of these secondary tumors. The patient was discharged well on the 24th of April.

TUMOR OF VAGINA.

CASE CLXV. — *Cystic Tumor of Vagina. Removal.* — A lady, 26 years of age, well-formed and healthy, two months before her confinement perceived a round and elastic tumor in the back part of the vagina. At the time of her confinement, it was forced down outside the vagina, and subsequently protruded on any motion, or on her assuming the upright posture. When she consulted me afterwards, she was in the fourth month of her second pregnancy, and the tumor caused great uneasiness. On examination, an elastic tumor the size of an orange was found arising from the posterior wall of the vagina, and extending from the os uteri to the external organs. The finger, being passed into the rectum, could detect the tumor pressing back and somewhat obstructing the passage of the canal. By a little manipulation, it could be gradually brought down outside the external organs, and was seen to be a rounded, elastic mass, covered with the mucous membrane of the vagina. The os uteri was quite large, soft, and patulous, and presented the appearance of a much farther advance in pregnancy than admitted by the patient.

She was etherized; the tumor was grasped by the hand so as to make it tense; and an incision two inches long made in the median line, and a delicate sac exposed. This was now partially uncovered, when it gave way, and about a gill of cream-colored fluid was evacuated. The sac was completely separated from its attachment by the knife and director. The wound was left to take care of itself, no stitches being used. She had no bad symptoms, and scarcely any sensations to indicate that an operation had been done. She was kept quiet for a week, from fear of the possibility of a miscarriage, and to prevent the mucous membrane of the vagina from bagging down and forming an inconvenient excrescence. The recovery was complete, and did not interfere with her pregnancy, which went on to a safe termination.

POLYPUS UTERI.

CASE CLXVI. — *Polypus of Uterus. Removal by Ligature.* — During 1847, a lady fell, while entering her house in the evening, and received a severe blow on the lower part of the abdomen from the stone step. She was carried into the house suffering greatly, and a profuse uterine hemorrhage followed. For some months she was confined to her bed, scarcely able to turn from pain, and suffering from occasional returns of the bleeding. Coming under the care of an experienced practitioner, a vaginal examination was made, which disclosed the existence of a polypoid tumor extruded from the os uteri. Being called in consultation, I advised an operation. At this period she was suffering from anæmia, and so exhausted as to make it unsafe for her to assume the upright position, as the attempt was always attended by fainting. A ligature was applied to the polypus, and the tumor separated on the fourth or fifth day, the subsequent recovery being rapid.

The patient remained well until 1851, when the recurrence of hemorrhage at the menstrual periods, severe pains and bearing-down sensations in the back and loins, indicated the existence of uterine disease. Added to the above symptoms was the discharge of a gill of watery fluid from the vagina once in five or six days.

A tumor was discovered occupying the whole fundus of the uterus, and projecting into the vagina. With some difficulty, the finger could be passed into the cavity of the uterus through the os, which tightly embraced the central part of the polypus; with the speculum it could be distinctly seen, its parietes presenting a white, glistening appearance. A strong ligature, made of whip-cord, was applied to its base in the following manner: Two porte-nœuds, threaded with the ligature, were carried up through the os uteri to the base of the tumor; then, by taking one in each hand, they were made to describe a semicircle around the polypus. The ends of the ligature were now engaged in the serre-nœud of Graefe, which being carried up to the root of the polypus, the threads were disengaged from the porte-nœud, and the ends drawn as tight as possible and secured. By means of a screw, the pressure was increased daily and the tumor destroyed, so that the instrument separated at the end of a week, no constitutional symptoms of consequence having occurred.

This patient has since menstruated, and enjoys good health.

CASE CLXVII. — *Polypus of Uterus. Removal.* — A woman, 40 years of age, who had borne a number of children, entered the Hospital in May, 1860, for menorrhagia. She attributed it to hard work, and for a year had constantly bled more or less daily. A vascular polypus was found projecting from the os uteri: it was flat, and about the size of a cherry. The patient said the tumor would occasionally fill up to a large size, so as to project through the external organs. The os uteri was much enlarged and very hard; and the body of the uterus was tipped back, and could be felt of the size of a large orange in the rectum. I twisted off the polypus with a forceps, but could get no instrument into the os. The bleeding at once ceased. Ergot in the form of troches, at the rate of fifteen grains three times a day, was then given, and on the second day brought on expulsive pains; but no tumor appeared. At the end of a week, the os uteri had diminished to half its previous size; and, a fortnight after the operation, there had been no further hemorrhage, although she constantly had the sensation of its

returning. The only reason to which I can ascribe the large size of the uterus is the constant irritation of the bleeding polypus and the efflux of blood for its supply.

CASE CLXVIII. — *Polypus of Uterus. Removal.* — A healthy, unmarried woman, 30 years old, of regular menstruation, while making some effort was seized with a pain in the back and a sensation of something giving way in the pelvis. Shortly afterwards, she had hemorrhages, — probably uterine; and, in a few days, noticed a substance projecting between the labia. At every subsequent menstrual period she was subject to menorrhagia, and recently the bleeding recurred in the intervals. Her strength was much reduced, and she suffered constantly from pain in the loins. There was also a leucorrhœal discharge.

On examination under ether, a red, granulated body, the size of a pigeon's egg, was discovered protruding between the labia. On passing the finger up the vagina, the tumor was found to be attached by a long neck to the inside of the uterus. The os was open and everted, so that the finger passed readily into the cavity of the womb.

The tumor was grasped with a pair of broad forceps (such as are used for drawing out the tongue), and twisted around five or six times, when it came away without resistance. I preferred this method to the more tedious one of ligature. There was no bleeding, and the following day she was quite well.

FOREIGN BODY IN VAGINA.

CASE CLXIX. — *Large Hair-pin extracted from the Vagina of a Child thirteen years old.* — I was requested by a physician to see a child whom he had visited in the morning, in whose vagina he had discovered a hair-pin firmly impacted. For a number of years, she had been troubled with a purulent discharge and other symptoms, for which many physicians had been consulted, and many applications had been made without avail. As her symptoms were becoming more urgent, her physician was consulted, who advised an examination. The girl,

finding that this was to take place, confessed to her mother, that, seven years before, while in company with other children, she had introduced something into the vagina, and that she had always been aware that its presence was the cause of her troubles, and had determined never to disclose the fact, and was now induced to do so only by the fear of the threatened examination. One prong of a hair-pin was detected just within the vagina, which could be drawn down a short distance, exposing the end of it externally; but the other end, being firmly impacted in the side of the passage, prevented farther movement.

In the afternoon, I was requested to see the case. The patient was a large, healthy-looking girl, thirteen years old, of rather more intellect than is usual for one of her age. She was etherized, as the parts were swollen, and too sore to admit of an exploration without giving great pain. On passing the finger into the vagina, the whole passage was found thickened and of almost a callous hardness. The upper part, or bend, of the hair-pin was in contact with the cul-de-sac of the vagina. Half of one prong was deeply implanted in the wall of the vagina to the extent of about two-thirds of its length. It was incrustated, to a thickness equal to about a third of its diameter, with calcareous matter. By careful manipulation, the iron was gradually bent to an angle at the point where it penetrated the parietes of the vagina. Two-thirds of it could now be drawn outside the passage. Before proceeding farther, the finger was passed into the rectum to ascertain if the pin could be felt on that side; but it seemed to have passed more towards the tuberosity of the ischium. By exerting considerable force, and twisting it in various directions, it was loosened and drawn out. Before bending it, an attempt was made to push it up into the vagina; but the passage had become too narrow, from the effects of the inflammation, to admit of this manœuvre. She soon entirely recovered.

OCCLUSION OF THE VAGINA.

At the time when the first of the following cases came under my care, little had been published in regard to occlusion of the vagina, and some embarrassment was felt as to the proper course to be adopted. Latterly, however, more attention has been paid to the subject.

The subjoined cases give some details in regard to the diagnosis in retention of the menstrual secretion, and the mode of giving exit to it, when the anatomical relations of the parts are abnormal either from disease, congenital malformation, or difficult parturition, and may be of use in future cases of a similar character:—

CASE CLXX.—*Occlusion of Vagina following a Tedious Labor. Vesico-vaginal Fistula. Retention of Catamenia. Operation. Recovery.*—1850. A married woman, 20 years of age, a year before had been delivered, by means of instruments, of a dead child, after a labor of four days. Very severe inflammation followed, attended with sloughing of a portion of the vesico-vaginal septum, so that the remains of the bladder, falling down, became adherent to the posterior wall of the vagina, and obliterated the passage. There was also a valvular opening from the neck of the bladder into the lower part of the vagina.

The menstrual secretion had been retained since her confinement. At first she suffered at the regular periodical returns of the catamenia from pain and distention of the abdomen, with a sense of bearing down in the rectum. Afterwards, the pain became almost constant, and so acute as only to be relieved by large doses of narcotics. From these causes she was almost bedridden, and very much emaciated.

The constant dribbling of urine had rendered the orifice of the vagina so extremely sensitive that it was impracticable to make any examination until the patient had been placed under the influence of ether. The cul-de-sac at the commencement of the vagina was just sufficient to admit the end of the fore-

finger. From its upper part, the urine escaped through the valvular opening, so situated that a probe could not be made to enter the bladder. On passing the forefinger into the rectum, a hard and slightly elastic tumor could be felt about two inches from the external orifice, pressing backwards and partially obstructing the bowel. The other hand, placed on the abdomen, distinguished a large globular mass rising above the brim of the pelvis, pressure on which communicated a distinct impulse to the finger in the rectum.

The above examination led to the conclusion, that the tumor felt in the abdomen and rectum was the uterus and upper part of the vagina distended by the menstrual fluid.

The patient, being fully etherized, was placed on the edge of the bed, with the limbs supported as in the operation for lithotomy, and the labia held apart by silver hooks. The forefinger was now placed in the rectum to serve as a guide, and a transverse incision made across the lower part of the vagina through its parietes, so as to expose the cellular membrane lying between it and the rectum. This dissection, passing under that portion of the vagina which served as a fundus to the bladder, was continued upwards between these organs for two or three inches, until the distended sac could be distinctly felt.

A very large trocar and canula was now plunged into the tumor; and, when withdrawn, a quantity of thick, tarry-looking fluid began very slowly to flow through the tube. About a pint was allowed to escape, when the canula was withdrawn, being too short to be left with safety, and a female catheter introduced in its place.

In the afternoon of the day of the operation, she was comfortable. At intervals, however, there were severe contractile pains in the uterus like those attending the first stages of parturition; and by them the catamenial fluid was forcibly expelled. Warm fomentations were applied to the back, and an opiate administered, by which her sufferings were temporarily relieved.

On the following day, I learned that she had passed an uneasy night; the pains continuing at intervals, causing a free evacuation of fluid. Her mother estimated, that at least two quarts

had passed through the instrument, with the effect of greatly diminishing the tension of the abdomen. Towards evening, she had an access of pain and fever, with some obstruction to the discharge: the bowels being constipated, she was ordered castor oil. The medicine operated with much relief. The uterus resumed its action, and could be felt above the pubes, somewhat tender on pressure, and contracted into a small, well-defined tumor.

For about a week she improved steadily, the discharge continuing at intervals. It was with the utmost difficulty that any instrument could be retained in the opening; and, when displaced, the aperture was found to have so contracted as to render its replacement almost impracticable. The external organs were very sensitive.

During the second week, she was attacked with a catarrhal affection, during which, from some exposure or error in diet, she was suddenly seized with violent pains in the abdomen, meteorism, great sensibility on pressure, with other symptoms denoting peritoneal inflammation. These were gradually relieved by treatment, the patient barely escaping with her life. During this attack, the canula had necessarily been removed, and every measure for maintaining the opening abandoned. The menstrual secretion came on naturally, about four weeks after the operation, and found an exit without difficulty.

The subsequent improvement was gradual, and only interrupted in the course of the summer by an attack of varioloid.

I subsequently heard from this lady through her mother, who informed me that from a mere skeleton her daughter had become quite robust; that she had regained her health and strength so as to be able to use exercise on horseback; and that the menstrual secretion was natural at the regular periods.

CASE CLXXI. — *Occlusion of Vagina after Labor. Retention of Catamenia. Operation. Relief.* — On Feb. 4, 1850, I was applied to by a married woman, aged 30, in consequence of the suffering produced by the retention of the menstrual fluid from an occlusion of the vagina subsequent to parturition.

In the August previous, she had been delivered of her first child after a labor of four days, during a portion of which time the head of the infant remained in the pelvis. Instruments were used, but ineffectually; and the delivery was ultimately accomplished without them. Very severe inflammatory symptoms, attended with a purulent discharge, followed; and finally it was discovered that the vagina had become entirely obliterated. From that time, the return of every catamenial period had been marked by the most distressing pains in the back and abdomen, lasting three or four days, and progressively increasing in violence, accompanied with some constitutional disturbance. These repeated attacks gradually impaired her health.

An examination showed that the vagina was entirely closed, and hardly a perceptible cicatrix could be detected to indicate the line of union. At the lower part of the vulva, an orifice was discovered large enough to admit a probe, which, on being introduced, could be passed up a distance of three inches in the direction of the uterus, and was distinctly perceived through the recto-vaginal parietes by the finger introduced into the rectum. At this period, no abdominal or rectal tumor was ascertained to exist. It was determined to etherize her, and attempt to restore the vaginal passage.

The patient being fully etherized, a bougie was passed into the fistulous opening. This was followed by the finger; and, by proceeding carefully in this way, distending and separating the adherent parts, a free opening was made of about three inches and a half or four inches. At this point, a regular organized septum precluded any advance, unless by the assistance of cutting instruments. A bit of sponge was therefore introduced, and directed to be kept in situ during the night.

On the day following, the sponge was removed, and replaced by another. This course was continued for a week, when, no tumor being discovered in the rectum to indicate the situation of the distended uterus, and there being no trace of the os uteri in the vagina, it was determined to suspend any farther proceedings, enjoining upon her to use all necessary means for keeping the passage open until the distention caused by the

menstrual secretion should be sufficient to serve as a guide to the knife.

Two months after, having rigorously followed up the above directions, she visited me a second time; suffering in the same way as before, and urgently demanding relief. An examination elicited no change in the situation of the parts. As the pain was very distressing, however, I consented to make an incision at the upper part of the vagina, with the hope of throwing some light upon the direction in which the enlargement of the uterus was taking place. This was done, and the dissection carried as far as was thought safe, but with no good result.

On the 3d of May, I again saw her. She had for four days been in extreme pain. The vagina, so far as it had been dilated, I found to be of its natural dimensions. The finger, introduced into the rectum, at once detected, about two inches from the anus, a hard tumor, such as might be presented by the enlarged prostate in the male, and with as little sensation of fluctuation. She informed me, that, for the previous twenty-four hours, there had been a bloody discharge from the vagina; and traces of this secretion were perceived when that passage was examined, apparently coming from the mucous membrane. Not the slightest indication of any tumor could be found in this direction, even when the abdomen was strongly pressed upon.

Although the rectal tumor was free from fluctuation, I had no question, from my previous experience, but that it proceeded from an enlargement by distention with fluid of the upper part of the vagina or uterus, and therefore proposed an operation, which was readily acceded to.

On the 3d of July, the operation was performed, the patient being first etherized. The upper and back part of the vagina was cut freely through with a round-bladed bistoury; and very soon, with a slight dissection, the tumor which had been felt by the rectum presented itself, but much softer and more elastic than when examined through the intestinal wall. A large trocar was now plunged into it in a direction obliquely backward, in order to avoid wounding the os uteri, in case that organ projected into the vagina. A free discharge of the black, tarry substance described in the last case at once took place.

About half a pint of fluid having escaped, the canula was withdrawn, and the finger introduced into the opening, which was enlarged in either direction with a probe-pointed bistoury.

On exploring the cavity, no distinct projection answering to the os uteri could be discovered. The whole interior, both of the uterus and vagina, seemed to form but a single receptacle, a little contracted at one point, like the hour-glass contraction of the uterus, this apparently answering to the situation of the os tinæ. The mucous membrane appeared much swollen, and traversed by large vessels, which stood out in bold relief. A long, narrow bit of sponge was passed into the vagina, half of it being allowed to remain within and half without the opening just made. The patient declared herself at once relieved from all her distressing symptoms.

From the difficulty of maintaining the new opening, it was found necessary, a few days after the operation, to introduce a sponge tent, which was removed daily, and gradually increased in size. At the end of a week, the patient, having exposed herself immediately after the sponge had been removed, was seized with severe pains in the abdomen and in the lower part of the back, tympanites, and all the symptoms denoting inflammation. The treatment consisted in the application of leeches, and the other measures usually adopted. In three or four days, the pain and tenderness gradually concentrated at the lower and left side of the abdomen, where a large, hard tumor could be perceived through the parietes. These symptoms were suddenly relieved by the discharge of a quantity of pus from the vagina. The tumor in the abdomen now gradually subsided. The intestinal canal remained for a length of time quite irritable, diarrhœa being produced whenever she took solid food.

She left town on July 31st, quite weak, but improving.

She was advised to have a small rectal bougie passed into the opening in the vagina daily, as the disposition to contraction was still great; and it was thought unsafe, through fear of exciting a fresh attack of inflammation, to maintain any substance constantly in the aperture. For quite a number of years after the operation, she required to be kept under treatment, at times, to prevent the recurrence of the occlusion; but, in the intervals, enjoyed very fair health.

CASE CLXXII. — *Congenital Occlusion of Vagina. Operation. Recovery.* — 1851. A girl, aged 17 years, had been suffering for two years with a sense of distention and weight in the lower part of the abdomen and back, attended by a forcible pressure in the vagina, as if for the purpose of expelling some foreign substance. She had also been greatly annoyed with a frequent desire to micturate, and passed water as often as every twenty minutes through the day, but less frequently at night. She suffered much severe pain at the extremity of the urethra, which was aggravated by the passage of the water. She had never menstruated.

The following appearances were found: On separating the external labia, no traces of the vagina were visible. At the central part of the fossa, usually occupied by this outlet, the meatus urinarius was perceived surrounded by small vegetations, which, on the slightest touch, elicited the most violent resistance and cries from the patient. A probe being passed into the urethra, its farther progress was resisted at the distance of an inch from the orifice; but finally, by turning it upwards in almost a vertical direction, it entered the bladder, which was very much contracted.

The finger was introduced into the rectum, and at once detected a hard tumor two inches from the anus, pressing backwards against the spine. It seemed quite solid, and without the slightest indications of elasticity. On passing the hand over the abdomen at its lower part, a hard projection was felt in the centre just above the pubis, having a prolongation about four inches in length, extending into the right iliac region. Pressure on this swelling caused a movement of the tumor in the rectum, and was attended with much suffering.

No doubt remained in my mind that these tumors were caused by a retention of the menstrual fluid in the uterus, upper part of the vagina, and the Fallopian tubes.

The patient being fully etherized with chloric ether, an incision was made transversely across the mucous membrane of the lower part of the vagina. This disclosed muscular fibres, which being carefully divided through the aperture thus made, a delicate membrane of a dark color protruded. It was suggested

by one of the gentlemen present, that this might possibly be the peritoneum, which, in a case of malformation and non-existence of the vagina, had taken an abnormal direction. For the purpose of testing this, I attempted to separate it from the surrounding textures, knowing the loose character of the cellular tissue which attaches the peritoneum to the neighboring organs and the pelvis. This was at once found to be impracticable; and, on a renewal of the effort, the resisting part yielded, and the finger passed through into what appeared at first to be the abdominal cavity, so well defined was the anatomy of the walls of the pelvis. The absence of intestines, and the appearance of a small quantity of dark-colored fluid by the side of the finger, soon made it evident that the vagina had been opened. The size of the cavity occupying the entire pelvis, and the complete absence of os uteri or other boundary between the uterus and vagina, were on examination sufficiently evident to all present.

By the aid of slight pressure on the abdomen, about half a pint of thick, tenacious fluid escaped. As the uterus did not at once take on contractions, no further efforts were made to evacuate the fluid; but a bit of sponge was introduced into the opening to prevent the parietes from adhering. The vegetations at the orifice of the urethra were now removed by the scissors, and the base of the tumors cauterized with nitrate of silver. To show the extreme sensibility of these tumors, it may be observed, that, as soon as they were interfered with, the patient, although well etherized and perfectly passive through all the previous operation, immediately drew back as if in extreme pain.

On the day following the operation, she was reported to have passed a good night. The sponge was removed from the vagina, and a free discharge of the peculiar fluid took place; after a few hours, it was again introduced. No urine had been passed since the operation: during the succeeding night, however, a copious evacuation of the bladder took place. She continued to improve, and the tumor of the abdomen to diminish. The finger, passed into the vagina, could distinguish the os uteri, as it were, gradually forming itself. It was about the size of a

tumbler, with thick edges, and covered with dilated blood-vessels. The sponge tent, when withdrawn, was very offensive.

A week after the operation, she was quite well; the urine was passed naturally and without pain, the sensitive tumors of the urethra having been destroyed; the discharge from the vagina had partially ceased, or had been replaced by a serous exudation; and her appetite and digestion were natural.

At her urgent request, she was then allowed to return home to the country, where the treatment was continued by her physician. A month after the operation, the vaginal discharge ceased, and she was reported to me as well.

CASE CLXXIII. — *Congenital Occlusion of the Vagina.*
Operation. Relief. — A girl, 14 years old, began to suffer, two years before I saw her, with pains in the lower part of the back and abdomen. These pains gradually assumed a periodical character, coming on at an interval of four weeks, and were so intense as to require alleviation by means of medicine.

A physician, being consulted, suspected an obstruction of the vagina; and an examination confirmed his suspicions, showing this passage to be completely occluded. An incision was made through the solid obstruction which presented at that part, with the hopes of discovering a cavity containing the menstrual fluid; but the operation met with no success. From this time, the sufferings of the patient gradually increased, and, at the menstrual periods, were so severe as to produce a degree of prostration which confined her for some days to her bed, and finally even threatened life.

When I first saw her, the external organs of generation were so sensitive as to cause great complaint on any attempt at an examination. The external labia were found to be well developed. The orifice of the urethra occupied its normal position, or was a little lower than natural. Below this, not the slightest depression indicated the orifice of the vagina. The finger, being introduced into the rectum, detected, at the distance of about two inches from the anus, a hard, globular tumor, the size of a billiard-ball. Before removing the finger from the rectum,

a catheter was passed into the bladder : and this was at once felt by the finger in the rectum, in the median line ; the coats of the bladder and rectum only intervening, for a distance of one or two inches, that is, as far as the above-mentioned tumor. At this point, the catheter could be made to pass on each side of the tumor, but was with difficulty detected in the rectum. I had no doubt, from the result of the examination, that the tumor felt in the rectum was the upper part of the vagina and uterus distended by fluid, and the cause of the serious symptoms under which the patient labored. An operation was therefore proposed, and at once, with the assistance of her physician, performed. Anæsthesia being induced, a transverse incision was made directly below the orifice of the urethra. With much caution, a dissection was now made between the rectum and the bladder, until, by cutting and separating the tissues with the fingers, the tumor described as felt in the rectum was reached, lying very deep, and affording but little opportunity for a fair examination. The depth at which it lay, and its apparent solidity, for a moment caused some embarrassment as to the proper course to be pursued, especially as one of the gentlemen present seemed convinced, from its hardness, that it could not contain a fluid. But, finally, being satisfied in my own mind that the tumor could be nothing else but what had been suspected, I determined on puncturing it. The escape of the thick, tarry fluid at once confirmed the truth of the diagnosis. The aperture was now enlarged so as to allow two fingers to pass freely up into the cavity containing the fluid, which was apparently the uterus and upper part of the vagina distended so as to form a single sac.

The patient, on recovering from the effects of etherization, declared herself entirely relieved from her previous state of suffering. The use of the prepared sponge, to prevent the closure of the passage, was advised ; as also the occasional introduction of bougies, to maintain, if possible, the normal size of the canal. The operation was followed by complete recovery.

CASE CLXXIV. — *Occlusion of the Vagina occurring soon after Marriage. Operation. Relief.* — The patient

was a widow, 45 years of age. The account she gave was, that she was married at an early age; that *les premières approches du mari* were so violent as to cause a severe inflammation of the vagina, which eventually terminated in the almost complete closure of the upper part of the canal. At the catamenial periods, much difficulty and suffering were experienced in the egress of menstrual fluid, which was discharged slowly, and apparently by a circuitous route. She suffered from this cause until within three years, when that function ceased to be performed, but was replaced by a mucous secretion. Her health was poor, and she had been more or less troubled with pains in the back and loins, all of which she attributed to the retention of fluids in the uterus.

An obstruction was detected about two inches from the orifice of the vagina, caused apparently by an adhesion of its parietes. With the aid of the speculum, a small aperture was observed on one side, into which a probe penetrated a short distance.

As the patient insisted on having an operation, I consented to do it; although, at the same time, I informed her that it was very doubtful whether the obstruction was the cause of the symptoms, considering the present state of the functions of the uterus.

A director was forced into the passage, which had at first only admitted a probe. This was followed by a larger instrument; and, by proceeding gradually, it was shortly found possible to use the dressing forceps. By this means, the passage was finally enlarged so as to admit the little finger, when, by tearing and distending the parts, almost the full size of the original passage was restored, and the extremity of the os uteri exposed, buried in the adjacent structures.

The calibre of the canal was maintained by the same means as had been resorted to in the preceding cases. The patient expressed herself much relieved by the operation; and, when seen a month afterwards, there had been no recurrence of the previous symptoms under which she had suffered.

CASE CLXXV. — *Occlusion of the Vagina. Retention of the Menstrual Fluid. Operation. Relief.* — A girl, 16 years old, was first taken, in 1855, with pains in the back and loins, such as precede the menstrual flux, which did not, however, appear. The pains were repeated every month, usually lasting three or four days. In January, 1857, she suffered from retention of urine, which was relieved by the use of the catheter. The same thing occurred in February and March. In April, while passing the catheter, it was found to encounter a resisting substance; and, in order to get it into the bladder, it was necessary greatly to depress the handle and elevate the point, to surmount the obstacle. Her physician then made a further examination, and discovered a round, hard tumor in the abdomen, and another projecting into the rectum.

I saw this patient on the 26th of April, and discovered an occlusion of the vagina, and a great collection of the menstrual fluid in the uterus. It being inconvenient to treat the patient at her own home, it was decided by the friends to send her to the Hospital, under my care.

Previous to the operation, the following were the phenomena elicited by an examination: A cul-de-sac about half an inch in depth constituted the vagina, at the lower part of which was a white line, or puckering, perhaps a cicatrix, the result of some previous inflammation. A catheter could not be passed directly into the bladder, as it encountered an elastic substance; and it was necessary to elevate the instrument almost perpendicularly to introduce it into that cavity. In the rectum, a large, hard, inelastic tumor was to be felt, two inches or more from the anus, nearly filling the pelvis. A large tumor could also be distinguished in the abdomen, extending just above the umbilicus; and the patient said that occasionally she could feel two lateral tumors there. During April, the pains had been incessant, as if for the expulsion of some substance from the body. The sister stated, in explanation of the cause of the obliteration, that she had heard the parents say, that for a long time, when the child was two or three years old, it had been affected by an ulcer in that region.

The patient being etherized, and the bladder emptied, a free

transverse incision was made across the cul-de-sac; and, with a little dissection, a delicate bladder-like substance was brought into view. Pressure being now made on the abdomen, and the pelvic tumor made tense so as to project through the incision, a large trocar was plunged into the cavity, and at once a thick, tarry fluid began to flow slowly out. The finger was now gradually insinuated, a bistoury introduced, and the opening enlarged so as to leave no feeling of constriction in any direction. The forefinger, being passed freely into the cavity, could detect no sac; but the walls of the pelvis could be felt on all sides, the collection of fluid having been so great as to distend the uterus to its utmost capacity, and render its walls so thin that they could scarcely be distinguished. She was placed in bed, and the fluid allowed to escape gradually, which it continued to do during the day. About a quart of fluid escaped, which at once coagulated, expelling but little serum. Dr. Calvin Ellis made the following microscopic observations: "The menstrual fluid removed from the vagina contained epithelium cells; yellow, granular corpuscles, of various sizes; blood globules, evidently recent; and very small, translucent globules with distinct, though pale, outlines." On the following and second days, the os uteri was observed to be slowly forming itself, and the thick walls of the uterus could be detected.

The patient rapidly recovered.

In the first of the cases which have been given, the only apparently feasible way of arriving at the distended uterus was adopted; viz., that of penetrating to it by a dissection carried up between the rectum and vagina. The proceeding eventuated more satisfactorily than could have been expected. The greatest obstacle to a rapid recovery was the difficulty of maintaining the new opening, on account of the disposition to contraction; and this was found to be true in all the cases. What appeared to be a large, free opening, with no restriction on any side but the bones of the pelvis, in the course of a few days was contracted to a firm, unyielding ring, into which it was difficult to introduce a small bougie. The sponge tent, when it could be borne, at once dilated the aperture again to a size as great as could be wished; but the extreme sensitiveness of the

parts prohibited, in the case under consideration, a resort to this powerful agent. In fact, it was finally found necessary, on account of the great resistance made by the patient, to desist entirely from all applications, and leave the course of it to nature. The subsequent month, the catamenia appeared slightly; and there was, so far as I know, no obstruction to it afterwards.

In the second case, the obliteration of the vagina, which was closed throughout nearly its whole extent from the upper part to the vulva, was also caused by laborious parturition.

It may serve as an example to show the necessity of making inquiries, after a severe case of labor, as to the degree of local inflammation, and of taking measures for preventing, if possible, such adhesion as occurred in the second instance. This is a matter of difficulty and delicacy; but, as so much is at stake, these considerations should give way to a correct appreciation of the danger which would ensue from neglecting an examination, when the discharge from the vagina is so offensive as to suggest the possibility of gangrene and subsequent adhesive inflammation.

It may not be useless to call attention to the great resistance, and, in two of the cases, entire want of fluctuation, which existed in the distended sac formed by the uterus and vagina, as felt through the rectum, since this might lead the surgeon to doubt the accuracy of his diagnosis, did not other marks assist in forming it.

Recently, I have had two cases of apparently entire obliteration of the vagina in married women, in whom conception has taken place, and at the time of labor the head of the child forced its way through the septum without injury to the neighboring parts. Both cases have done well, and there has been no return of the occlusion.

OCCLUSION OF OS UTERI.

CASE CLXXVI.—*Occlusion of Os Uteri. Collection of Pus in Uterus. Operation. Progressing Recovery from Uterine Disease. Death from Gastric Disorder.*—In the

following case, I was called in consultation. A young woman, 17 years of age, on the second day of her regular menstrual period, wet her feet; the catamenial discharge suddenly ceased, and she had a rigor, followed by pain from left ilium to ribs. After a little treatment, she was able to be about. The menses not appearing six weeks subsequent to their suppression, she consulted a physician, who noticed an unusual fulness above the pubes. This rapidly increased, and in a few weeks the patient presented the appearance of a person at the seventh month of utero-gestation. On examination, the uterus gave the sensation of being distended, and no entrance could be made into its cavity with a bougie or sound.

At the time I was called, the abdomen was slightly sensitive to pressure, and projected anteriorly to a great degree; but there was no corresponding lateral fulness, which we usually see in pregnancy.

After a careful examination, I decided to puncture the os, and, passing a trocar into it with considerable force, seven pints of offensive pus were evacuated.

For a time the girl improved; and at a second operation, four weeks after the first, three pints of pus were removed.

About a week after the second operation, the patient, having previously lived on a liquid farinaceous diet, ate immoderately of potatoes and cabbage. She was immediately seized with purging and bilious vomiting, which resisted all remedies, and sank rapidly and died. Her physician informed me that no unfavorable re-action followed either operation, and that she was doing very well up to the time when she committed the above excess in eating.

No post-mortem was allowed.

CASE CLXXVII. — *Occlusion of the Uterus. Rupture of the Left Fallopian Tube. Peritonitis. Death.* — 1858. The patient was a woman 40 years of age, large and fat. About the year 1854, she had a very severe confinement, and had never menstruated since. For the last nine months, she had been for the most part confined to her bed, and suffered extreme pain. Dr. B. Brown, on examination of the abdomen,

found a large, firm tumor, which he at once recognized as the uterus distended by the retained menstrual fluid. When I saw her, in consultation, this tumor was very prominent, standing out in bold relief from the abdomen. Its upper part, toward the sternum, was flat; below, toward the pelvis, round; and in its centre was a deep depression. On examination of the vagina, this canal was found to terminate in a smooth cul-de-sac, and not the slightest mark of the os uteri could be distinguished, nor any thing to mark the point of its obliteration, except a very slight roughness on the vesical side of the vagina. By the rectum, no tumor could at first be found; but, by pressing the finger very high up into the pelvis, the point of a firm, solid mass, of a conical shape, could be reached. The patient being in great suffering, it was decided to appoint a day for cutting down at the upper part of the cul-de-sac of the vagina, and attempting to reach the tumor. On the day before the one fixed for the operation, her physician called on me to say that it would be unnecessary, as, very shortly after the investigation had been made, a bloody or tarry discharge from the vagina had commenced to flow, and had continued to do so since, being accompanied by forcing uterine pains, and with a great diminution of the abdominal swelling. Under the circumstances, it was thought best to make an examination with the speculum, on the following day, in order, if necessary, to take the opportunity of enlarging the opening into the uterus. A speculum being introduced, at once revealed, at the upper part of the vagina, a thin, bladder-like tumor, from which, by a small opening, the tarry fluid exuded more freely when pressure was made on the abdomen. The speculum being withdrawn, the finger at once penetrated the thin partition alluded to, and could be carried for some distance, in a curved direction, toward the right groin, being prevented from passing toward the abdomen by a firm, unyielding tumor, which appeared to be the uterus, firmly distended by fluid. A catheter, being passed into the bladder, showed that organ to be forced down into the pelvis; and the finger could easily be passed beyond it. It was decided to temporize, especially as the discharge continued, and the patient was getting ease. In the mean time, it should be stated,

the right lobe of the abdominal tumor had disappeared. The patient suffered no inconvenience or pain from the examination, which was a slight one.

The following day, she was suddenly seized with a violent pain in the abdomen. All the signs of high peritoneal irritation were evident, and continued for about two days, when she died.

A post-mortem examination explained the cause of death. The right lobe of the tumor had been formed by the uterus, which had emptied itself through the vagina. The left lobe consisted of the left Fallopian tube, enormously distended into a very delicate sac, by the retained menstrual fluid. There was no communication between the Fallopian tube and the uterus; and the former had ruptured, and discharged its contents into the abdominal cavity, causing death. This tumor, which was felt through the walls of the vagina and uterus, had been forced over into the right groin. The cavity of the uterus was continuous with the vagina, the os uteri being obliterated. In one or two cases of occlusion of the vagina which I have had, both Fallopian tubes, in a distended state, could be felt lying on the uterus, but were completely emptied by the operation, at the same time with the uterus.

HYPERTROPHY OF CERVIX UTERI.

CASE CLXXVIII. — *Hypertropic Elongation of the Cervix Uteri of twenty-six years' standing, with Projection of the Enlarged Os beyond External Organs. Ulceration. Hemorrhage. Operation, followed by Complete Cure.* — 1862. The following case fully sustains the anatomical description of the disease as given by Huguier in his very interesting and important work. It also shows how unsafe any surgical procedure would be, based on the idea of a simple enlargement of the os and cervix uteri, without taking into view the very remarkable displacements of other organs which occur in the course of the disease when it has proceeded so far as to be projected to any extent beyond the labia.

A lady, 56 years old, and of rather a delicate constitution,

married when twenty-nine years of age, shortly after her marriage took a long voyage, and suffered severely from sea-sickness, followed by a miscarriage. About a year after, she was confined with her first child, having a tedious labor: this was followed by some prolapsus of the womb. During a subsequent pregnancy, the prolapsus was relieved; but, after the birth of the child, it was reproduced in a greater degree than before, and since then she may be said to have been continually suffering from disease of the womb. When I first saw her, the os uteri was enlarged, and projected between the external organs, irritating all the neighboring parts, and giving rise to constant embarrassment in locomotion. The brain also, to a considerable extent, was sympathetically affected; and for a number of years she had been scarcely ever free from a sense of weight and pain in the head. For some months before I first attended her, she had been confined to her room, both from the irritation of the disease, which caused great difficulty in walking, and from the debility produced by repeated and severe hemorrhages from an ulcer of about the size of a quarter of a dollar, situated near the end of the tumor, and similar to the ulcerations noticed in such cases by M. Huguier. The tumor seemed to be of an erectile character, having periods of increase and diminution of size, the former state being accompanied by an effusion of blood from its face.

At the time of the operation, she was quite pale and thin, and so feeble as scarcely to be able to move about the room. The tumor presented the following appearances: It was from three to four inches long, and about four inches in circumference at its extremity, its base covered by mucous membrane, which, from long exposure, had, to a certain extent, assumed the character of skin. On the under and back part of the tumor, near its end, was the opening of the os, into which the finger could be introduced to the extent of from two to three inches. A probe passed about two inches farther. At the base of the external tumor was the meatus urinarius. A catheter introduced into the bladder took a downward direction, and its point could be felt half-way down the tumor. Of course, there was no cul-de-sac of the vagina in front; but behind the tumor the

finger could be introduced to a depth of from two to three inches. On exploring the rectum by the touch, the finger could be hooked downwards into the peritoneal cul-de-sac, which was dragged down by the tumor to a distance of about two inches external to the cavity of the pelvis. The body of the uterus was felt, about the thickness of the thumb, and an inch and a half long, in its natural position. It will be seen, from the above description, that, by any operation for removing all the tumor which projected between the labia, about a third or a half of the bladder and a considerable portion of the peritoneal cul-de-sac would be included in the incisions.

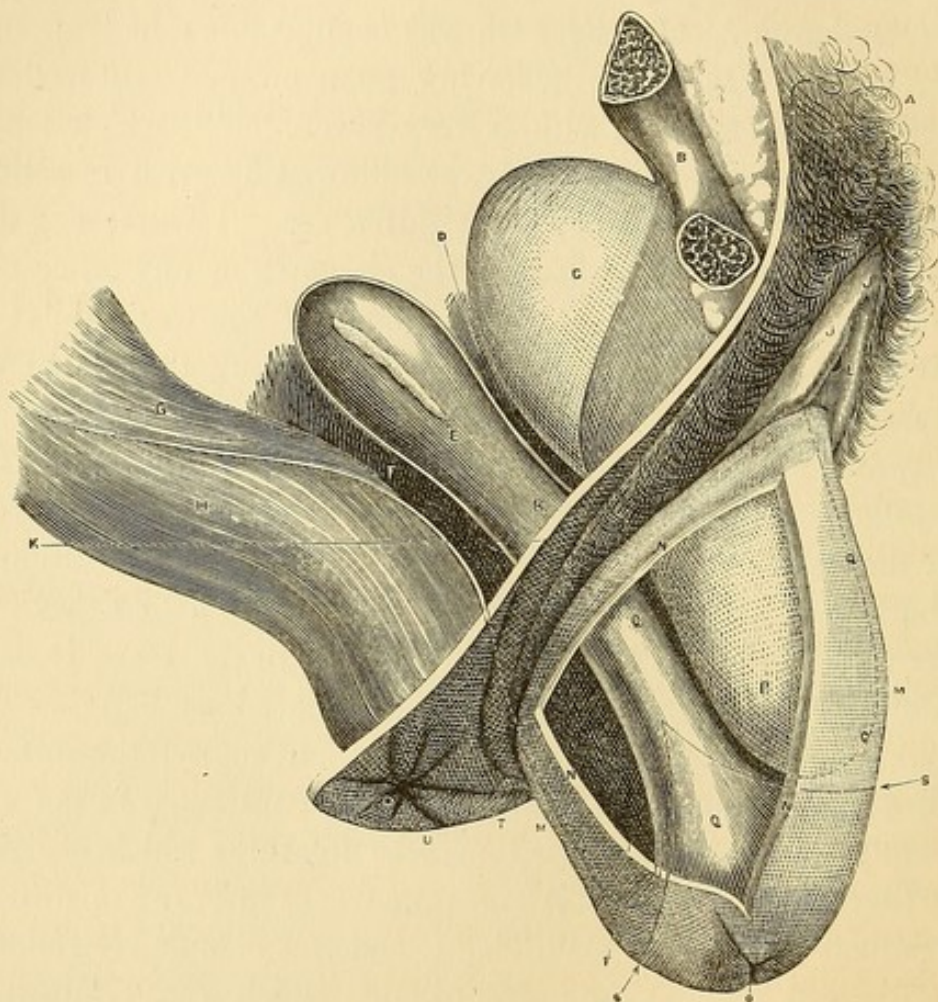
The operation was performed on the 18th of November, 1862. The patient being etherized, the legs bent as in the operation for lithotomy, the extremity of the tumor was firmly seized by strong hooked forceps, and drawn downwards and forwards. An incision was made in the back part of the tumor, about two inches from its extremity, and just in front of the peritoneal cul-de-sac, which was marked by the finger hooked down into it from the rectum. This investment being dissected backwards, the enlarged cervix was cut into about an inch higher up, until its cavity was opened. Large vessels, which now spouted in every direction, were tied. The dissection was then continued in front. The tumor being carried backwards and a catheter introduced into the bladder, an incision was made directly in front of it, and the bladder dissected off from the body of the tumor as far as the level of the incision on the posterior aspect of the cervix. The section of the tumor was now completed, the base of it being firmly held by the hooked forceps until all the bleeding vessels were secured by ligatures. The form of the incision is well shown, in the woodcut, by the curved dotted lines *s, s.* Great care was taken to make the dissection slowly, and to secure every vessel as soon as cut; and by this means, although many vessels were divided, the loss of blood was very moderate. On relaxing the hold with the forceps, the portion of the uterus which remained, together with the adjacent organs, resumed their natural position in the pelvis. At the end of the operation, the pulse, probably from the stimulus of the ether,

was much stronger than at the commencement. There was some nausea produced by the ether, but no vomiting. She took brandy in the course of the night, and paregoric, for a pain in the abdomen. All went on well for two or three days; on the 23d, having some pain in the abdomen, she was relieved by a hot fomentation. On the 24th was comfortable; had an opiate at night. On the 25th, having gone on perfectly well for a week, she was seized with a very severe chill, which lasted three-quarters of an hour, and was followed by great re-action, hot skin, intense headache, great thirst, &c. I could not discover the slightest tenderness of the abdomen or any other evidence of local trouble, and I was told that she was subject to similar attacks. I had thus far been unwilling to disturb the bowels with medicine. An enema was ordered, which had no effect, and was followed by a dose of tincture of rhubarb. On the following day, the 26th, she was wholly free from fever; and, the medicine having not yet operated, a dose of infusion of rhubarb was given, with the effect of producing two dejections. After this, she began to take solid food. On the 1st of December, she had another chill, which was relieved as before. An examination at this time, with the speculum, showed the surface, from which the tumor had been removed, contracted to the size of a quarter of a dollar; two or three ligatures which still adhered were taken away. About four weeks after the operation, the patient was able to walk about, and was completely relieved of all irritation about the pelvic organs, which were retained in their natural positions. The pain and feeling of weight in the head, which had oppressed her so long, had passed off as if a cloud had been swept away. She returned home about the middle of December, and I had the satisfaction of seeing her entirely cured about two months later. During the latter part of her stay at the Hospital, she was kept on as full diet as she could bear, and porter and spirits were given freely, with the effect of relieving the very anæmic condition under which she labored when she entered.

This case is interesting from the perfect cure of a complicated and rare disease of many years' duration, and from the operation being the only one, so far as I know, that has been done in

Boston, and, with the exception of Dr. Martin's case, in Roxbury, the only one done in this vicinity.

I heard from this lady nearly eleven months after the operation, in a condition of almost perfect health.



- A. Mons Veneris.
- B. Right portion of symphysis pubis severed through obturator foramen.
- C. Upper portion of bladder lying behind the pubes.
- D. Anterior cul-de-sac of the peritoneum.
- E. Body of uterus.
- F. Posterior cul-de-sac of the peritoneum.
- G. Peritoneal coat of rectum forming posterior wall of the posterior cul-de-sac.
- H. Rectum.
- I. and J. Labia majora and minora.
- K. Right genito-crural fold.
- L. Meatus urinarius.

- M, M. Anterior and posterior walls of vagina.
- N, N, N. Opening made through outer wall of tumor to show the relations of the parts within.
- O. Os uteri.
- P. Base of the bladder forming part of the tumor.
- Q, Q. Elongated and hypertrophied cervix uteri.
- Q', Q'. Outline of lower part of bladder.
- R. Body of uterus also elongated.
- S, S. Dotted line showing the course of the incisions.
- T. Perinaeum.
- U. Anus.

The accompanying woodcut is copied from the work of M. Huguier, and is as good a representation of the present case as if taken from the actual subject.

In connection with this case, the following one of hypertrophic elongation of the cervix, and enlargement of the os uteri, together with fibrous tumors of the body of the organ, may be mentioned : —

CASE CLXXIX. — *Hypertrophy of Cervix Uteri.* — A widow lady, 48 years old, and the mother of one child, came under my care at the Massachusetts General Hospital in May, 1863. Fifteen years before, she discovered a small tumor in the left side of the abdomen, which gradually increased in size, attended with a sensation of weight and bearing down, but without acute pain. This was followed a year after by a paralytic attack of the left side of the body, from which she partially recovered. Profuse flooding had occurred several times during the four or five months immediately preceding her admission to the Hospital, materially diminishing her strength. She experienced much difficulty in passing urine, a fact easily explained by the displacement of the uterus and surrounding organs.

She was a good deal emaciated, but had a fair pulse, and was able to take some exercise out of doors every day. The abdomen was enlarged, and of a conical form, from the presence of a tumor of about twice the size of a cocoa-nut. An elongated tumor, nearly three inches long, and of about the same circumference, projected between the labia. This tumor, which might at first sight have been mistaken for a simple prolapsus of the vagina, consisted in reality of the elongated and hypertrophied cervix and os. The meatus urinarius opened upon the upper and front part of the tumor. The boundary between the tumor and the coats of the vagina was marked by wrinkles of the mucous membrane. A careful exploration of the abdomen disclosed two tumors, one above the other, which together filled the cavity of the pelvis, and encroached on the rectum. Simpson's sound could be passed but a short distance into the os: the finger was arrested at the os internum; but the obstacle was easily overcome by the use of a sponge tent, and the finger then passed readily into the small cavity of the organ.

A consultation with several gentlemen distinguished in the

obstetric art resulted in a decision unfavorable to any operative interference.

The patient remained under observation in the Hospital about a fortnight, when she was seized with pains in the abdomen, and died with symptoms of peritonitis.

On post-mortem examination, a large intra-mural tumor was discovered, obliterating nearly the whole cavity of the uterus. This was the tumor which had been felt immediately above the pubes. The second tumor, which had been felt above the first one, was attached to the exterior wall, directly over the other, and was connected with the uterus only by a small pedicle. A third tumor, of the size of a pigeon's egg, was found near the upper part of the cervix, making its way into the cavity of the uterus, and might probably, after a time, have made its appearance through the os, and thus have come within reach of a surgical operation. The external tumor proved, as had been supposed, to be the os and the greatly elongated and hypertrophied cervix, which, had there been no other disease to forbid it, might have been removed as in the case just related.

OVARIOTOMY.

The extirpation of large *ovarian tumors* has been occasionally practised for a long time. Within a few years, the operation has been revived in England and in this country with remarkable success; many patients, otherwise doomed to a lingering death, having been completely cured by it. The great obstacle to the more free performance of ovariectomy is the hesitation which the surgeon feels to advise, or even to permit, a patient in the enjoyment of moderate health to undergo an operation which may almost immediately prove fatal. In itself, ovariectomy is not more dangerous than many of the recognized capital operations; the difference being, however, that these last are done in a pressing emergency, while ovariectomy generally is not. The proper course of practice would therefore seem to be, to make a fair statement to the patient and friends of what they have a right to expect from the operation, leaving them to decide for themselves. I have once been completely successful

in the treatment of an enormous unilocular cyst of the ovary, in which respiration was impeded, the limbs œdematous, and the patient rapidly failing, by evacuating the cyst, and leaving the canula in position; making occasional use afterwards of iodine injections, to correct offensive discharges.

One point to be especially noticed in the manner of performing ovariectomy is the method of securing the bleeding vessels of the pedicle. The plan now most in favor is by drawing the stump out of the wound, and compressing it in a clamp made for the purpose. This proceeding, however, is sometimes followed by severe pain after the operation, especially if there is much tension of the parts. Professor Simpson, of Edinburgh, has lately recommended "acupressure" as a substitute for the clamp, and claims for it substantial advantages.

Although it seems almost superfluous to give the precaution not to mistake pregnancy for ovarian tumor or dropsy, yet I am led to do it from the fact that such mistakes do occur. The differential diagnosis is not always easy between ovarian tumor and pregnancy, and we should remember that they may co-exist. I have heard of instances where the abdomen of a pregnant woman has been punctured for supposed ovarian dropsy. The following cases in my practice are adduced as illustrative of the subject:—

A patient applied to me, who said she had a tumor appear under her ribs immediately after her last confinement, and at the end of nine months—when I saw her—her abdomen was immensely distended. She said that she had been advised an operation. Not having the time to examine her, I sent her to a friend distinguished in the obstetrical art, who informed me, that, after a thorough examination, he found pregnancy existing, with a great superabundance of amniotic fluid. She was confined very soon after, with a healthy child. In a case of supposed ovarian disease, sent to me from a great distance for operation, the symptoms had been anomalous, and such as early to lead to the suspicion of tumor. On auscultation, I heard the sounds of the fetal heart. It is very possible that pregnancy in this, as in the next case, had supervened on the original tumor. In a third case, and one which would be much

more likely to lead to error, a woman applied at the Hospital with an ovarian tumor of one side, of eighteen months' standing. She was treated by the internal administration and external application of iodine. She applied once or twice afterwards, at intervals of two or three months, the tumor gradually enlarging. Finally, having delayed for six or seven months, a tumor, which was supposed to be the same, was found, filling the whole abdomen. She was shortly after confined, and since then I have not heard from her.

CASE CLXXX.—*Large Ovarian Cyst. Puncture. Canula left in the Wound. Cure.*—A married woman, aged 41 years, entered the Hospital, March 1, 1860, with a large ovarian tumor filling the entire abdomen, pressing up the ribs, and encroaching so much upon the cavity of the chest, as to cause great difficulty in respiration. The limbs were in a highly œdematous state, and she was in a very feeble condition and rapidly failing.

The tumor began fourteen months before, and increased gradually until it measured four feet in its greatest circumference.

As it was suspected that the tumor, which was uniformly elastic and fluctuating, was unilocular, it was decided to puncture it with a large trocar, and leave the canula in the wound. This I did March 4th, and drew off eighteen quarts of light, straw-colored fluid. The canula was left in the wound, and secured there. March 10th, the plug was removed from the canula, and a pint and a half of fluid escaped, thicker and more gelatinous than that drawn first. March 19th, the discharge from the canula was thicker, and somewhat of a purulent character.

In April, from exposure, a sudden swelling of the abdomen took place, with considerable tenderness, attended by a febrile attack, the discharge from the sac becoming somewhat offensive. A weak solution of iodine was thrown in with good effect, and corrected the offensive state of the secretion. Constitutional and local means were also used to allay the irritation.

April 28th, the sac had contracted very much, so as to form quite a small tumor in the abdomen. All the symptoms de-

tailed above — such as difficulty in breathing, dropsy, &c. — were completely relieved ; and she left the Hospital in an improving condition. I heard from her a year afterwards, quite well and stout.

The sac then formed a small, hard tumor, about the size of a billiard-ball, on the left side of the abdominal cavity.

VESICAL CALCULUS.

CASE CLXXXI. — *Large Vesical Calculus in Female, filling the whole Bladder. Lithotrity. Recovery.* — In June, 1865, a woman, 36 years of age, entered the Hospital under the care of Dr. Francis Minot, in an extreme state of emaciation, suffering from disease of her bladder. Dr. Minot sounded her, and, detecting a stone, referred her to me. It seems that, twelve years before, after the birth of twins, micturition became painful and frequent, and the urine was mixed with blood. The symptoms were then alleviated until her second pregnancy, when they returned. For the last eight months, these symptoms had been constant, confining her to her bed, with a degree of pain requiring the constant use of large doses of morphine. She had no power to retain the urine, which dribbled away, mixed with mucus, pus, and blood. On a chemical examination, it was found to be very strongly alkaline, containing a thick, ropy deposit, with some albumen. Under the microscope, many blood and pus corpuscles, epithelial scales, and crystals of the triple phosphates, were observed.

On sounding the bladder, it was found nearly filled with an immense calculus.

A question arose in this case as to the choice, considering her feeble state, between lithotrity and lithotomy. It was decided that this should depend upon the hardness of the stone.

She was etherized, and the stone seized with the lithotrite in its shortest diameter. The screw was applied, and the stone easily crushed ; the fragments were seized twelve times with great rapidity, and thoroughly broken up. The débris was then seized with a large, spoon-billed female lithotrite, — which I had contrived to work with one hand, — for operating in the

female bladder; the other hand being occupied in the vagina in supporting the bladder, and guiding the fragments into the jaws of the instrument. For three or four days after the operation, no fragments escaped, although there was a great sense of relief. At the end of a week, the operation was repeated with the female lithotrite, and a great quantity of fragments removed. At the end of another week, it was again repeated under ether, and the bladder to all appearance effectually cleared. The stone, in its largest circumference, must have been at least six inches. The patient, from a state of exhaustion and constant suffering, was, at the end of five weeks, restored to better health than she had ever before enjoyed. Two months after the first operation, a second was required to remove a small fragment which remained.

RENAL CALCULUS.

CASE CLXXXII. — *Calculus in the Kidney, with a Fistulous Opening, supposed to be Carious Bone. Death. Autopsy.* — A widow, aged 45, entered the Massachusetts General Hospital, Oct. 1, 1858, with what was supposed to be caries of a lower rib or of the transverse process of one of the vertebræ. Thirteen years before, she had fallen down two pairs of stairs, and was supposed to have broken one of her ribs. She soon recovered sufficiently to be able to work, but still had constant pain in the side. Ten years after, the pain increased, attended with swelling, and an abscess formed in the loins just below the last rib, which was opened, and a quantity of pus evacuated: a fistulous opening remained; and, when she entered the Hospital, it was recorded, that dead bone could be felt by the probe.

Oct. 3d, a sponge tent was introduced, and the opening gradually enlarged.

Oct. 16th, the patient was etherized, and the surgeon in charge made a small incision so as to facilitate exploration. No bone could be detected. This examination was repeated on the 22d, at which time the discharge from the wound was considerable.

Nov. 8th, she came under the care of another of the surgeons. No dead bone could be found with the probe; but on Dec. 20th, the patient being etherized, an incision was made, and bone was supposed to be felt, but could not be removed.

March 12, 1859, she came under my care. A bent probe was passed deep into the wound, and, being carried under the rib, occasionally struck what appeared to be bone divested of periosteum. All the other surgeons present probed the wound; and the conclusion arrived at was, that the substance felt was too deep for a portion of rib, but probably was the transverse process of a vertebra in a carious condition.

From the depth and circuitous route at which the substance was reached, and the great solidity of the surrounding textures, which had been so long inflamed, it was found quite impracticable to seize the supposed bone. The opening was therefore dilated by powerful forceps, free incisions being out of the question, from the danger of cutting into the thoracic or abdominal cavity. The attempt at removal was necessarily discontinued for a time, as, from the very feeble condition of the patient, the administration of ether, probing, or any unusual interference, was accompanied by great depression of the pulse and excessive prostration.

The patient had a very yellow, almost jaundiced, complexion, through the whole duration of the treatment, with little or no appetite, bowels excessively constipated, and a constant nausea. The urinary secretion was very scanty and disturbed. An attack of nausea and vomiting always followed the use of the probe, so that I was very averse to interfere with the wound, and avoided doing so unless strongly solicited by her.

April 12th, she had severe pain in the side, which was a little relieved by opiates.

On the night of the 21st, there was severe pain in the bowels. During the morning of the 22d, she was very weak, with considerable tympanites. She failed rapidly, and died in the evening.

The autopsy was made by Dr. Ellis. "The pleuræ, lungs, and heart presented nothing very remarkable. The peritoneum, omentum, and other parts, were reddened; and a large

quantity of pus was found in the cavity of the peritoneum. The large intestines were quite firmly adherent in the left lumbar region.

"The seat of the left kidney was occupied by a dense mass of fibrous and adipose tissue. The cut surface of this presented, for the most part, the same appearance as the exterior; but in the centre was a portion of reddish substance, perhaps an inch in diameter, and near it others of smaller size. Within this was a smaller cavity, lined with a serous membrane. This resembled the pelvis, and was occupied by an irregular, branched calculus, of small size, of a yellowish white color, and laminated. It was retained in its position by one or more prolongations. At the part which adhered to the posterior wall of the abdomen was an opening through which a probe passed into the cavity, and came in contact with the calculus. This opening was, undoubtedly, continuous with the sinus known to exist before death; but the point was not investigated until after the separation of the kidney. Nothing was noticed indicative of recent inflammation having its origin in this part of the abdomen. There was no caries of any bone; but the sinus ran just below the last rib, which could be touched by a probe.

"What appeared to be the remains of renal substance was examined by the microscope; but the infiltration of fat globules made it impossible to distinguish any thing else. There was no trace of healthy tissue.

"The cortical substance of the right kidney had an unusually white appearance."

ABSENCE OF VAGINA AND UTERUS.

CASE CLXXXIII.—*Absence of Vagina and Uterus.*—A very delicate and intelligent young woman, 21 years of age, applied to me in March, 1860, and after some hesitation informed me that she had never menstruated; and that, an examination having been made by some female physician, she had been informed that a malformation existed about the organs of generation. To my question, whether any symptoms ever occurred of a disposition in the menstrual secretion to establish

itself, she said that, when about fifteen years of age, she was seized with violent pains in the back, loins, and legs, which recurred, and kept up at intervals for the space of two or three weeks; and that she was informed by her physician, that it was probably an attempt of the system to establish the regular monthly periods. This attack, however, passed off without the menstruation making its appearance; and there had never been any indication of the performance of that function since, or any vicarious discharge elsewhere to take its place.

On a partial examination at this time, with the patient lying on her side, I felt, in the usual situation of the vagina, a small opening, into which the probe passed up readily three or four inches. I therefore, perhaps too hastily, informed the patient, that the rudiments of a vagina existed, though quite small, and could probably be enlarged by an operation. I made no farther examination at the time, but could not explain why the menstrual fluid should be retained while the passage existed, which, though very small, must apparently lead up as high as the uterus; and at the same time why there was no tumor, and none of the usual suffering attendant on retention of the menstrual fluid within the uterus. The patient, having no convenient place in Boston for the operation, decided to enter the Massachusetts General Hospital, which she did about two weeks afterwards, when she was etherized, and a thorough investigation made of her case.

On ocular inspection of the external organs, I at once found that I was mistaken as to the existence of any opening into the vagina. The opening, in fact, which I had taken for it, was that of the urethra displaced from its usual situation below the pubes to a point about the centre of the vulva, perhaps an inch in front of the anus. A catheter being introduced through this aperture, the contents of the bladder flowed freely out. The catheter being left in the bladder, a finger, introduced into the rectum, came at once in contact with the instrument; the vagina being absent, and nothing but the coats of the rectum and bladder intervening. The finger being now passed higher up, and hooked, as it were, into the cul-de-sac of the peritoneum, no uterus could be discovered; but its place was occupied by a

cord somewhat larger at the centre than sides, and this cord being followed up, at the distance of two or three inches from the central portion, a body could be felt about the size of a common garden bean. The patient in other respects seemed to be well-developed and perfectly formed.

The announcement of the actual state of the case to her caused great distress. As it was of importance to discover whether the usual sexual peculiarities existed, I made, with as much delicacy as possible, some questions on this point; to which she replied, that she had always considered herself a woman in every respect.

I made a second examination of the case some days afterwards, with the patient in the erect position, thinking that, if any uterus were present, I should thus be more likely to detect it than if she were on her back, but with the same result as before.

In a late number of Guy's Hospital Reports, an interesting case is given of absence of the vagina, where the uterus became so distended by the menstrual fluid as to require an operation. When the patient was first examined, the surgeon passed his finger into a passage supposed to be the vagina, but which he soon discovered to be the dilated urethra. The uterus was punctured through the rectum to the entire relief of the patient, the aperture remained open, and she was heard from afterwards as having the menstrual discharge regularly through it, and without any difficulty.

CASE CLXXXIV. — *Complete Absence of Vagina and Uterus.* — April, 1858, a patient supposed to have an occlusion of the vagina was sent to me by a medical friend. She was 25 years of age, well developed, about five feet two or three inches in height, and had been married four years. She had never menstruated; and it may be mentioned, that her mother did not menstruate till the age of twenty-one, after she had been married one or two years.

On examination, I found what at first appeared to be a very small vagina, which would only admit, with much suffering to the patient, the little finger. The sensation imparted was as if

the finger had passed through the tissue of an old cicatrix. Supposing this to be the vagina contracted from some inflammatory process which had occurred at an early period of life, she was advised to go into the Hospital for farther investigation. Having entered, after the lapse of a few days, she was etherized previous to an examination, both to save her feelings on the score of delicacy, and also to allow of any surgical operation, if one should be deemed necessary.

On inspection, the breasts were found to be well developed. The external organs of generation, the clitoris, nymphæ, &c., were normal; there was hair on the pubes. In the situation usually occupied by the vagina was an aperture large enough to admit the little finger. No urethra could be found; and this aroused suspicion as to the true nature of the case. The finger was now passed into the canal, and the other hand being placed on the external walls of the abdomen, it was evident that both coverings, or rather both walls of the bladder, were not embraced between them. The finger being withdrawn, and a catheter introduced, the urine at once flowed through it, showing conclusively that this was the bladder, and that the finger had been passed through the dilated urethra. The finger being introduced again as before, and a finger of the other hand passed into the rectum, no traces of vagina or uterus could be found; while the forefinger of the left hand in the rectum could be hooked, as it were, into the cul-de-sac of the peritoneum, and this dragged down nearly to the anus.

From the result of this examination, it was at once evident that no surgical operation could be of any benefit. I was disposed, however, to keep her under observation until the next menstrual effort, which, according to her account, took place monthly, and was announced by pain in the back lasting four or five days. In case any rudiment of the uterus existed, it was thought probable it would be manifested at that time. She was therefore advised to remain in the Hospital to afford further observation of the case. Nothing however was discovered bearing the least resemblance to a uterus.

During the four years of her marriage, so far as I could learn, a very partial indulgence in sexual intercourse took place, which

resulted, probably, in the great dilatation of the urethra which was observed.

The above case is interesting from the fact, that the patient presented perfect external development, accompanied by the usual sexual feelings, with a complete absence of two of the important organs engaged in the sexual functions. It may be added that no vicarious discharge of any description supplied the place of the menstrual secretion.

In one or two instances which have fallen under my notice when the vagina and uterus were wanting, the urethra was placed lower down, as in the above case; and, instead of occupying its ordinary situation, it formed a continuation of the rudimentary vagina.

A case of entire absence of menstruation in a young woman may here be mentioned, who consulted me some years since. A sound was passed into the uterus, but no obstruction was detected. This patient had a vicarious bloody discharge from the rectum once in six weeks, lasting some days. Development and sexual feelings were normal.

HERMAPHRODISM.

CASE CLXXXV. — *Supposed Encephaloid Testicle. Operation. Death. Autopsy. Hermaphrodisism. Disease proved to have been Ovarian Tumor.* — A person giving the name of Thomas M——, 21 years of age, applied to me in April, 1859, on account of a great enlargement of what appeared to be the right testicle. His external appearance was that of a young working Irishman. The beard was full, strong, and black, the larynx of the ordinary size, and the voice masculine; the shoulders were broader than the hips; the muscles were well developed; height sixty-five inches, of which thirty-three were above the pubes, and thirty-two below.

The patient's own history of the case was as follows: Early in life he lost, or had had removed, the left testicle, but could give no particulars of it. This account was probably fallacious.

The right testicle was greatly enlarged, measuring thirteen

inches in circumference, seven and three-quarters in length, egg-shaped, and extended nearly two-thirds of the distance from the pubes to the knee. It was excessively tense, hard, and seemed too heavy to be supposed a hydrocele, although the great evenness of its surface seemed to make such a supposition probable. There were large veins on its surface. What seemed to be the spermatic cord was well defined above the tumor, though a little harder than natural. There was considerable complaint of pain in the back and loins, which was attributed to the dragging weight upon these parts. The pain in the tumor itself was not excessive. The testicle had been, he said, of normal size till about a year before, when he received a severe kick upon it. After the first acute symptoms had subsided, it began to swell slowly; but within the last month it had increased very rapidly. The sexual feelings and power of erection continued natural till six weeks before I saw him, and since then they had completely disappeared. He never had sexual intercourse. About a month since, both breasts began to swell and become painful; and, upon examination, I found them to be of the size of those of a young female: the glandular structure could be distinctly felt, and the disk was about four inches in diameter. No fluid issued from them on pressure. I could not learn from him whether they had previously been larger than natural; but the present increased size seemed to have corresponded in time with the loss of sexual desire. He stated that his health was failing, he had lost his appetite, and was desirous of an operation to relieve him from suffering.

He was sent to the Massachusetts General Hospital, where the tumor was removed on Wednesday, April 13th, and the supposed cord tied *en masse* near the abdominal ring; some dissection being necessary in order to reach it above the disease. Previous to the operation, he had been excessively diffident about having the genital organs examined, and at this time the following appearances were first remarked. The glans penis appeared normal, but imperforate; the body of the penis was from two to three inches in length. Commencing about an inch from the glans, and extending to within two inches of the anus, was a fissure having on each side two flaps of delicate

epithelium, exactly resembling the nymphæ, which, being separated, presented, as it were, the external organs of the female. At the lower part of this fissure commenced apparently the urethra; and, an instrument being introduced about three inches, water escaped freely. External to the fissure, the skin was thin and delicate, like that in the neighborhood of the female organs of generation. The pubes was very fully covered with hair, which was shaved to facilitate the dressing after the operation. Dr. Dyer, house-surgeon of the Hospital, at my request took a cast of the breasts, their appearance was so unusual. My inquiries would have been much more particular in regard to the previous history, and especially as to any thing resembling the menstrual discharge, if I had had the slightest suspicion of the patient's sex.

The day after the operation, the patient complained a great deal of pain in the abdomen, and much fever, also of thirst, which was partly attributed to the ether administered. The febrile action gradually increased from day to day; the swelling and pain in the abdomen, however, subsiding until death, which took place on the seventh day after the operation.

An examination of the body was made on the following day. Both lungs were found studded with large masses of cancerous matter, and were adherent at certain points to the pleuræ. The liver at first appeared healthy; but, on being cut into, a number of cavities were discovered about the size of a filbert, containing a thick milky fluid. On the spine, at the root of the mesentery, was a mass of enlarged lymphatic glands, the chain of them extending down from the edge of the rim of the pelvis nearly to the groin, much flattened, and not perceptible through the walls of the abdomen. The neighborhood of the ring, just above the spot where the ligature had been applied, was in a gangrenous condition. The intestines being removed, exposed the following remarkable appearances in the pelvic organs: The bladder was somewhat distended, and just behind it lay a well-formed uterus of natural size, as in the unimpregnated state. On the left side of the uterus, the Fallopian tube terminated in its fimbriated extremity, under which lay the ovary, rather smaller than natural, and with one or two little bands of adhesion running

between it and the Fallopian tube. The ovary, being incised, displayed its ordinary structure. On the right side, the tube ran along under the peritoneum, turned upwards, and was lost in a diseased mass in the right groin. The parts were now removed with great care from the pelvis by Professor J. B. S. Jackson.

All the pelvic organs being removed, and placed on a table, we proceeded to investigate the relation of the different organs. A probe was passed into the urethra, and went readily into the bladder: being withdrawn, and depressed a little, it passed with equal facility to the fundus of the uterus. The parts were now turned over, and the back of the vagina and uterus laid open. The vagina, which commenced about an inch from the external orifice, was nearly four inches in length, and terminated in the os uteri; which, however, did not make much of a relief in the vagina, although the distinction in the two textures was fully marked. The arbor vitæ was very distinct, and beautifully shown: it extended nearly up to the fundus of the uterus. The blowpipe being introduced into the left Fallopian tube, air passed freely through it, and out of the fimbriated extremity. A probe could be passed for a certain distance freely in the right Fallopian tube, but air did not pass through it as in the other.

In regard to the tumor removed, the whole substance of it seemed to be converted into encephaloid matter, and its natural structure lost. The external covering was adherent, except at its anterior part: it was cut into early in the operation, and about a gill of a yellow-colored serum escaped; exposing, on the upper part of the organ, a collection of beautifully colored cysts, of all sizes, like a mass of brilliant crystals.

It would have been extremely interesting in this case to have decided whether menstruation had ever taken place through the urethra; but this, unfortunately, I had no means of determining.

The organs being given to Dr. Hodges, the demonstrator of anatomy to the college, for the purpose of a more minute dissection and investigation, he kindly furnished the following report:—

"Pilous development that of a male. Penis, which is that of an adult, and not of a youth, measures along its dorsum two and a half inches. The glans, of proportionate size, is covered, except in the immediate vicinity of where the frænum should be, by a well-developed prepuce. The urethra being cleft from the meatus backwards, the prepuce is not completed underneath, but becomes lost in the sheath of the penis.

"The urethra is traceable, along the under surface of the penis, from the meatus $3\frac{1}{4}$ inches, and disappears in an orifice $2\frac{3}{16}$ inches in front of the anus. Throughout this distance, it consists only of a fissure, or sulcus, the sides of which, having irregular borders, are in apposition. It is lined with well-characterized mucous membrane; and has, at various points, distinct lacunæ.

"Diverging obliquely upwards and outwards from the sides of the urethra are folds of integument, constituting distinct labia majora and minora. On the left, at the side of these labia, are indistinct marks of cicatrices.

"Examined internally, the penis consists of two corpora cavernosa, measuring from the meatus to their bifurcation 4 inches. They terminate in well-marked crura; and the nerves, arteries, and veins of the dorsum of the penis, have the usual size and position. The corpus spongiosum is well developed, but split longitudinally into two halves, which are to be seen on either side of and behind the corpora cavernosa, and correspond externally to two folds which form the labia minora.

"Cowper's glands were not found.

"The muscles of the perinæum were somewhat confused, but the following were distinctly made out: *erectores penis*, *compressores urethræ*, *levator* and *sphincter ani*; anterior to the latter was another elliptical sphincter muscle, corresponding, probably, to the sphincter *vaginæ*. The *transversus perinei*, as such, was not made out.

"The bladder is of ordinary size, but its muscular development is greater than usual. It has two ureters, normal as to their entrance and otherwise. From the internal orifice of the bladder to the 'vagina urethralis' it is $1\frac{1}{4}$ inch. Laid open along its anterior surface, its neck is embraced by a bi-lobed prostate gland of about half the natural adult dimensions; posteriorly to this, the neck is thickened, and the section is as through a structure resembling the prostate. On squeezing the prostate, its secretion is seen to issue through several apertures on each side of the urethra, where the prostatic sinus usually exists. There is no *verumontanum*; but where it should be, and where the sinus *pocularis* would be found, the urethra and vagina blend, and a probe

inserted and passed backwards enters the vagina ; passed forwards, it appears externally at the orifice in front of the anus. Behind the bladder are found the uterus and vagina. On dissecting up the bladder from the vagina, as far down as the prostate, no vesiculæ seminales are to be found.

"The uterus and vagina are $5\frac{7}{8}$ inches in length. The uterus, $2\frac{1}{2}$ inches long and $1\frac{1}{16}$ inch wide at its widest part, consists of fundus, body, neck, and os. The neck has unusually well-marked arbor vitæ. Just within the os, the mucous membrane appears abraded. The body has a triangular cavity, into which the Fallopian tubes enter by large orifices. The vagina, $3\frac{3}{8}$ inches long and $1\frac{1}{4}$ inch wide, is rugous, especially near its termination anteriorly, and has distinct columns. Anteriorly it contracts to terminate in the canal common to it and the urethra, and at this point has a sufficiently well-marked hymen.

"The Fallopian tube of the right side permits air to be blown through its whole length. Near its termination in a fimbriated extremity, it becomes a little convoluted and dilated. Its length is $3\frac{7}{8}$ inches. At a distance of $2\frac{1}{8}$ inches from the uterus, on the left side and in its usual position, is an ovary with a lobulated surface.

"The broad ligament on each side exists as in an ordinary female uterus. On the left side, the round ligament is to be seen diverging from the broad, and pursuing, so far as traceable, the usual course which it would pursue under ordinary anatomical conditions. On the right side, the Fallopian tube admits the passage of air only for a certain distance. Near the uterus, it is of large size ; but it soon diminishes and becomes smaller. It is traceable to the point at which the 'cord' of the tumor was divided, and is accompanied by the round ligament in its whole distance ; no appearance indicating the usual divergence of it from the Fallopian tube on the anterior surface of the broad ligament. No ovary is found on this side.

"The rectum lies behind the uterus, and is in all respects normal."

Dr. Ellis, microscopist to the Hospital, gives us the following results of his investigation : —

"Examined with the microscope, the breasts were found to be composed of fibrous tissue, and a few small nuclei. No lobules were seen.

"The mass removed before death consisted of two parts, the largest of which was rounded and solid ; the other was composed of cysts. The former was $4\frac{1}{2}$ inches long, $3\frac{1}{2}$ wide, and $2\frac{1}{2}$ thick ; the latter, two or three inches in diameter. On close examination, nothing like a vas deferens could be found ; but at one part were a number of parallel bloodvessels."

Remarks.—The internal organs, in the case we have been considering, seem evidently to belong to the female sex, with the exception of the prostate gland. The importance of this as connected with the male sexual organs has diminished in the eyes of distinguished philosophical anatomists who have lately written on the subject, being considered as much an appendage to the urinary organs as to the sexual. We therefore, with some difficulty, account for the impetus given to the external male organization, beard, larynx, penis, and general masculine formation of the body; and the views we have entertained in regard to the effect of the sexual organs on the external character seem to be very much disturbed by the present case. It might be very interesting to trace the analogies between different organs in the male and female systems, which are suggested in this instance; but we will refer to the very thorough and interesting paper of the distinguished Professor Simpson, of Edinburgh, on hermaphroditism, in the second volume of his obstetric works, edited by Dr. Priestly of Edinburgh, and Dr. Horatio R. Storer of Boston, where this whole subject has been most fully elaborated, and we may almost say exhausted.

In connection with the above case, I append the following, reported by me to the Boston Society for Medical Improvement, in May, 1857, and extracted from their records:—

“The subject of this very uncommon deviation from nature was 25 years of age, born in Maine, of healthy parents. He was by occupation a sailor; and the appearances to be described were only discovered when brought to the prison, where, on being undressed to put on the prison clothes, he was thought, from the large size of the breasts, to be a female in disguise, and was therefore transferred to the surgeon of the institution, Dr. Morris, for examination. On my visit to his cell, he seemed to have no objection to an examination, when it was explained to him that it was for a scientific object.

“Beginning with the face, the features are soft, and the expression mild; there is no beard. The neck is of medium size and length, but rising toward the back, as in the female. The shoulders are sloping, round and smooth, the muscles not being prominent. The upper extremities are delicate, and the hands small. The breasts, which are the most striking feature in this person, are large, well-developed even for a female, quite handsomely formed, with large blue veins running

over them, as in a nursing woman ; the nipples being large, with a broad, dark areola. The abdomen is quite prominent ; the navel deep ; the hips very broad, as in the female. There is a small penis. The scrotum and testicles are very small, the size of the latter being that of a bean. The legs are short, the middle of the body being, by measurement, half way between the umbilicus and the pelvis, instead of being, as in the male, at the pubic region. The voice is masculine ; the sexual propensities normal.

“ The remarkable feature of this case is the fact of the small male organs of generation implanted on a body almost entirely female. Cases constantly present themselves to the observation of medical men, of malformed genital organs, having the appearance of a combination of the male and female ; also of men with a large mammary organ. In this case there can be said to be no malformation.”

CHAPTER VIII.

THE EXTREMITIES.

FRACTURES.

THE great importance of these injuries, and the absolute necessity, in most cases, of proper treatment, have given them a very prominent place in the surgery of all ages. From the earliest times of which we have any record, down to the present day, the treatment has been oscillating between the employment, on the one hand, of powerful engines for their reduction and retention in place; and, on the other, of simple rest in an easy position. Both of these extreme modes of practice have been extensively employed within the past thirty years, and both have undergone great improvements.

In my early practice, I was in the habit of laying great stress on an immediate and exact application of retentive measures: often, I now think, to the discomfort of the patient, and perhaps in deference to the prevailing opinion. I have since become convinced of the propriety of doing as little as possible for the first few days: and have generally been content with making a slight extension, so as to bring the broken ends of the bone together so far as they will come without violence; then waiting until the irritability of the muscles has subsided, before proceeding to the application of the permanent apparatus of splints and bandages. In many fractures, where great immediate distortion is produced by muscular contraction, after a few days of rest, combined perhaps with gentle extension, the broken bones seem quietly to settle down into their proper places; and the whole treatment, after the proper application of splints, resolves itself into careful watching, with occasional slight manipulations to remedy accidental displacements, and to prevent excoriation.

Professor Hamilton, of New York, by the exhibition of a great number of cases, treated with the best received apparatus, has laid the profession under great obligations, by showing that the perfect adaptation of broken bone, and a cure without deformity, is the exception, and not the rule. To any one who takes a rational view of the question, it will easily be perceived that it is not the bone alone which is injured in cases of fracture; but that the soft parts, such as periosteum, muscles, fascia, and integument, are more or less implicated. Swelling ensues; and, even if it were possible to exactly discover the situation of the fractured ends, the manipulation is resisted by the patient. Ether, which of late years has assisted so much in the diagnosis of these cases, is not always at hand; and, even if the bone is replaced with its assistance, displacement may at once recur from the irritated muscles. Generally speaking, a slight inequality about the bones is of little consequence. Although looked on by the public as owing to a want of skill on the part of the surgeon, it is, in reality, unavoidable; and ultimately, in most cases, nature remedies any inconvenience caused by it.

Fractures in the neighborhood of joints are always serious injuries; and, with few exceptions, are apt to be followed by more or less permanent deviation from the natural position of the bone or bones implicated. In fractures about the hip-joint, years may elapse before the lameness is overcome; and, in many cases, it is permanent.

It is impossible to state exactly the time necessary for the union of a fractured bone. It depends on a number of circumstances; namely, the health of the patient, the manner in which the fracture was received, the parts injured which are afterwards engaged in the reparative process, and the treatment. In children, at the end of a month after fracture, I have often observed myself, and requested others to observe, perfectly dry crepitus that could be felt between the broken ends of the bone; the limb, at the seat of the fracture, being firm, and, to all appearances, able to be used.

Angular distortion after fractures should be treated, as soon as discovered, by gradually increased pressure, applied by means

of a straight splint and roller, or adhesive straps. It is worthy of remark, that very great deformity may be corrected in this way in young persons, even long after the receipt of the injury.

Fracture of the clavicle is perhaps one of the most common of the injuries to bones, and is one of the most troublesome to treat according to the old complicated method. Many years since, the simple apparatus of Dr. Fox, of Philadelphia, was introduced by me into the Massachusetts General Hospital, where it continues to be used with some slight modifications. It consists essentially in a pad for the axilla and a bag for the arm slung from the well shoulder. Many cases of this fracture do well without especial treatment; and we often see it already in a fair way to recovery in children brought to us for supposed lameness of the shoulder, resulting from a fall a week or two before.

Frequently, from the swelling of the soft parts, the cellular membrane in the neighborhood of the clavicle being very loose and extensible, it is almost impracticable to discover the fragments. By placing the patient on his back, with perhaps a pillow between the shoulders, as the swelling subsides, the fragments will generally be found to have assumed as good a position as they would have done with the most elaborate apparatus. In comminuted fractures, the central fragment or fragments are usually beyond our control. In one instance, I have seen a sharp piece of the bone standing at a right angle between the outer ones, which could not be displaced by any justifiable force, and threatened to make its way through the integument. This was prevented by means of adhesive plaster, applied in such a way as to bring different portions of skin successively over it, and thus too long pressure at any one spot prevented. The sharp point was ultimately partly absorbed, and partly enveloped in the callus; and the patient recovered perfectly, with the exception of a very slight irregularity of the bone. The results of fracture of the clavicle are almost always favorable. In the very large number of cases which have come under my notice, I have never known union to fail except in one instance, — that of a sailor severely injured at sea by a fall from a mast,

and not subjected to treatment, the blow being a direct one at the seat of fracture. The ordinary shortening which occurs after this fracture does not seem to impair the power over the arm.

The diagnosis in fracture of the condyles of the humerus, with dislocation of the fore-arm backwards, or in fracture of the humerus just above the elbow-joint, in the adult, is rendered very obscure by the swelling which almost immediately ensues. The fore-arm may usually be easily drawn into place, and the injury thus distinguished from a simple dislocation. Splints are borne with difficulty ; and it is necessary to keep the patient in bed, with the arm resting on a pillow, and apply cooling lotions to reduce the inflammation. When this is accomplished, angular splints of wood, gutta-percha, or paste-board, may be used to steady the joint. This fracture, under the best treatment, is apt to terminate with more or less loss of power to flex and rotate the fore-arm. Ultimately, however, very serviceable use of the limb may be gained. The injury usually occurs from a direct blow ; and the inflammation of the soft parts in the neighborhood of the elbow is more severe than in simple dislocation which results from indirect violence. Fracture of one of the condyles of the humerus into the elbow-joint is very apt to be followed by adhesions and loss of motion. When there is luxation of the joint, in addition to the fracture, splints become necessary ; but should be removed, and passive motion begun, as soon as the tendency to displacement is overcome.

Fracture of the lower end of the radius, which is of so frequent occurrence in winter, from a fall on the hand, is apt to be followed by deformity, and impairment of the motion of the part. I have treated this fracture, in many cases, with the simple and ingenious splint invented by Dr. Henry Bond, of Philadelphia. For facility of application, as well as for the comfort of the patient, it appears to me to offer important advantages over any hitherto invented ; not excepting the famous pistol-shaped splint of Nélaton, which, however, in some cases perhaps, may be found very useful, especially in those attended with much lateral displacement. In Dr. Bond's splint,

the hand grasps a wooden pad, the fingers being left free during the treatment, and sufficient motion allowed them to prevent the stiffness which is apt to take place where the arm and hand are confined by bandages between two splints.

Fracture of the lower third, or small part, of the leg, is often difficult to manage, owing to a projection of the tibia which occurs, attended with more or less deviation of the leg from a straight line; giving rise occasionally to lameness, by restricting the range of flexion of the ankle-joint. This deviation is best avoided by placing the limb upon a double inclined plane, applying extension and counter-extension by means of adhesive straps, fastened above by upright stanchions, connected with the leg part of the apparatus, and below to the foot-piece. Where the skin is tender, and obnoxious to pressure, suspension may be tried; the foot being well elevated. This fracture may also be successfully treated by the starched or plaster bandage. A slight degree of deformity is almost always left where there has been displacement in the beginning.

For fracture of the fibula near the ankle, with displacement of the lower fragment, the powerful side-splint of Dupuytren fulfils all indications.

Transverse fracture of the patella, attended, as it often is, by great separation of the fragments, may be most successfully treated by position alone. This I tried at first with the body slightly bent, and the limb raised at a great angle from the bed. The effect of flexing the thigh so much was to render the patient very uncomfortable. I was therefore led, as an experiment, to place the limb perfectly flat on the bed, which I found answered better than the theoretical posture devised with the idea of more perfect muscular relaxation. The old methods for confining the upper fragment by bandages are always inefficient, unless aided by a correct position of the limb, and are useless with it. They give rise to great swelling and much needless suffering, besides actually deranging the position of the fragments by so tilting them as to prevent their proper approximation. By the use of the ingenious steel hooks of Malgaigne, it is claimed that a still more accurate adjustment of the parts is obtained; but the plan has found little favor in this country.

The instances of this fracture which have occurred in my practice have been chiefly the result of direct violence, though quite a number of them were caused by muscular contraction alone. Twice I have met with fracture of the patella from the kick of a horse: one case did well under the use of a starched bandage, there being but little separation of the fragments; in the other, the bone was broken into several pieces, and the knee-joint implicated, producing an inflammation which resulted in death.

Transverse fractures of the patella are united by ligament, according to my observation, and perpendicular ones by bone. The latter leave no troublesome effects as a rule, the opposite being true of the former.

Fractures of the thigh of late years, unless for some special reason, have been treated by the apparatus of Desault, modified by the late Dr. Flagg of this city. It consists essentially of a long outside and a short inside splint; a band around the body with a perineal strap attached to it, for counter-extension, and a cross-piece below, uniting the outer and inner splints, with straps of adhesive plaster between for extension. The method of extension by bands of adhesive plaster, by which such good results are obtained, is due to Dr. Josiah Crosby of Manchester, N.H. I have employed successfully at the Hospital, within a few years, as have other surgeons of that institution, the plan proposed by Dr. Buck, of extension by means of a weight attached to the foot; the thigh being supported by short padded splints, and the counter-extension obtained by a perineal strap. By raising the foot of the bed, the weight of the patient's body, in most instances, gives sufficient counter-extension. Dr. Swinburne, of New York, has modified Dr. Buck's apparatus by dispensing with the use of all splints for the thigh. Eversion is prevented by placing bags of sand by the side of the limb. The great advantage of this treatment consists in leaving the limb open to inspection. It must be said, however, that we can use this method only with intelligent and perfectly docile patients. In very old and feeble persons, who frequently cannot bear even this slight restraint, the double inclined plane or fracture bed are to be preferred to any other apparatus, and permit a greater change of posture.

I have seen a few cases of oblique fracture of the lower part of the femur, just above the condyles, caused by a fall from a height, on the knee; the upper fragment projecting up just above the joint, and resisting all efforts for its reduction. This was the result of perforation of the muscles by the upper sharp fragment. In Sir Astley Cooper's great work on Dislocations and Fractures, this is well depicted. The process of restoration goes on very slowly, and the result is that the fragments unite at an angle. It is possible, when the nature of the case is detected early, that the bone might be disengaged by manipulations under ether; but the swelling caused by the injury ensues so rapidly, and is so great, that the exact condition of the parts is liable not to be recognized.

In oblique fractures of the femur, except perhaps in very young children, more or less shortening always remains, even under the most skilful treatment. It is, however, generally so slight as to be of but little consequence, frequently not exceeding a quarter to a half inch; in which case it is compensated for by a deviation of the pelvis. The time required for the union of a fracture of the thigh is usually stated at six weeks; but it does not follow that the callus has become firm enough, by this time, to admit of the use of the limb in standing or walking. The too early use of a fractured limb is often followed by the gradual bending of the bone, resulting sometimes in considerable deformity. If, for any reason, it is thought proper to allow the patient to rise from his bed at this stage of the treatment, the limb should be supported either by splints, or the starched or plaster bandage, and crutches used for a time.

Patients with fracture or dislocation of the spine, the latter being seldom unaccompanied by the former, I have often treated in public and private practice; and have a few times cut down upon and removed fractured and displaced pieces which were pressing upon the spinal cord. In one instance, — a man whose neck was dislocated from being suddenly and forcibly bent down by striking against a beam, while passing into a shed on the top of a load, — a temporary restoration of innervation was produced by making tractions on the head, by which the dislocation was reduced. After this, the patient was placed in bed, the head

of it being raised so as to form an inclined plane, with a strong band under his chin. He died, however, with the usual symptoms attending this accident. I do not remember, out of quite a large number of these injuries that have fallen under my observation, a single case that was benefited by any operative procedure. It may possibly be the case, that this has been too much neglected of late years from the want of success attending the operation. An instance may occur now and then in which an operation might result happily. The subject has recently excited considerable discussion abroad.

Of modern appliances for the treatment of fractures, the starched bandage of Seutin, or, still better, the dextrine bandage of Velpeau, or the plaster of Paris apparatus, are among the most important. There are, in fact, but few fractures in which they are not useful at some stage of the treatment. In simple fractures, where there is not much injury of the soft parts, the bandage may often be applied with advantage immediately upon the receipt of the injury. In other cases, it is necessary to wait until the swelling and inflammation have subsided. After union has been effected by the use of other appliances, the starched or dextrine bandage is very useful in supporting the newly formed callus, and guarding the limb against accidents when the patient leaves his bed.

The application of these bandages is very simple. A dry roller of old linen or cotton is first applied, to prevent adhesion of the bandage to the skin. A common roller is to be dipped in the adhesive liquid, either starch paste or solution of dextrine, and is then to be applied to the limb in the ordinary manner, taking care to make as few reverses as possible. The dextrine solution, which may be made in part with alcohol, dries sooner than the starch, and makes a firmer case with the same thickness of roller. If starch is used, the whole should be strengthened by strips of wet pasteboard, placed on the outside of the dry roller, before applying the starched one.

The plaster apparatus consists, first, of a soft dry roller or a thin layer of cotton, applied next to the skin, and covered by a second roller, wet with water. The whole bandage is then covered with plaster mixed with water to the consistency of

thick cream, and confined, if necessary, by another roller. The surface of this may be smoothed with a little more plaster, applied with the palm of the hand, and the whole apparatus completed by a coat of shellac varnish. This apparatus is easily applied, and becomes perfectly solid in the course of the short time required for its application. The plaster should not be wet until the moment it is to be used; and, if it still sets too quickly, a little alum water may be added.

The starched bandage may be employed with great benefit in those vexatious and often unmanageable injuries, — sprains of the ankle; thus allowing, in some cases, of locomotion at once, where a tedious confinement would be necessary under other treatment. I have also employed it, for the purpose of compression, with excellent results, in that very troublesome disease, milk abscess.

CASE CLXXXVI. — *Fracture of the Malar Bone.* — 1861. A gentleman, walking in State Street, was run against by a drunken man, who struck him on the side of the face with his head, fracturing and causing the depression of the cheek-bone. I saw him immediately after the accident. He said that he felt at the time as if he had received a blow from a hammer. The malar bone I found broken, and the external portion driven in, and firmly fixed. I made an effort to raise it: first, by manipulations on the outside; and afterwards, by passing the fingers into the mouth, and forcing them up under the zygomatic arch. Failing in this attempt, a wooden spatula was pressed up in the same way, as far as it would go, and an effort made to pry the bone into place. The effort was ineffectual, and the bone did not seem to yield in the least. I therefore advised the application of an evaporating and anodyne lotion to the face; and asked him to report himself to me again in a week, as he lived out of town. At the end of that period, I found that he had pretty much recovered from the soreness produced by the blow: but the depression of the bone still continued.

I had occasion to see this patient for another accident, nearly a year after the date of this injury; and found the face quite

well, and the irregularity of the bone completely obliterated. The patient informed me that he had experienced no interference either in the muscular or nervous apparatus of the face. The orbit, in this case, was not apparently implicated in the fracture.

In a similar case, which occurred about the same time, the accident being produced by a blow of the fist, and in which I made the same efforts to replace the bone, but without effect, the ultimate result was the same. So far as I know, this is the usual history of these cases; attempts at replacement being ineffectual, and the results generally favorable.

CASE CLXXXVII.—*Fracture and Depression of the Anterior Wall of the Superior Maxillary Bone, with the Malar Bone.*—The following is the only instance I have seen of this uncommon accident. A gentleman coming out from bathing slipped suddenly on the seaweed; and, before he could protect himself with his hands, fell, a projecting rock striking him under the eye, and depressing the malar and the upper part of the maxillary bone at the margin of the orbit. The suffering at first was intense, and, as it subsided, left the jaw and the teeth of that side in a benumbed state. The depressed portion was fixed, and of course could not have been elevated except by means of a trephine. The patient recovered well, though slowly, and without perceptible deformity; the nerves of the teeth being, for a long time, in an insensible state.

CASE CLXXXVIII.—*Fracture of both Upper Maxillary Bones, and Separation from Bones of Face.*—An old lady, aged 70, descending some steep steps into a cellar, fell, and received the full force of the fall on the face. I saw her shortly afterwards, in a state of imminent suffocation. The superior maxillary bones were detached, and had been driven back into the throat; the whole face, in fact, appearing as if forced inwards. Both from the blood, and from the obstruction caused by the pressure of the bones in the fauces, breathing was very laborious, and was becoming less and less possible when I saw her.

The bones were drawn forwards, and easily restored to their places: recurrence of the displacement was prevented by a bandage, securing the upper and lower jaws together, liquid food being given between the teeth.

Great swelling and ecchymosis of the face followed; but the fractured parts united well with the bones from which they had been separated, and the woman fully recovered.

I have twice met with this accident, both cases occurring in a similar way.

CASE CLXXXIX. — *Fracture of Epiphysis of Head of Humerus.* — In June, 1865, a girl, 16 years of age, was brought to me, who had fallen down stairs the night before, and who said she had wrenched her shoulder. She could not raise the arm without great difficulty, and there was much tenderness over the deltoid muscle. The shape of the shoulder was natural, the head of the bone being evidently in its place. On seizing this with one hand, and rotating the humerus with the other, the head of the bone moved with the shaft, and no crepitus was felt.

She was examined by a number of surgeons, and some thought it to be a rupture of muscular fibres; others, simply a strain.

In the course of the investigation, the arm was raised up to a right angle, and carried somewhat backwards, when, on rotation, an occasional crepitus could be distinguished.

This examination being borne with difficulty, it was determined to etherize her, which her parents would not consent to till the following day. The next day she was placed fully under ether; and, the muscles being relaxed, the head of the bone was projected forwards, as had been done the day before. The epiphysis could now be seized with the fingers; and, the shaft being rotated, it moved freely within the capsule, independently of the rest of the bone.

A pad was placed in the axilla, and a shoulder-splint applied: the arm was confined to the side, and supported in a sling. She came to the Hospital, from time to time, for advice and dressing. The bone united very rapidly, and, in the course of a few weeks, the motions of the arm were entirely restored.

This case is quite interesting from its rarity, also from the fact of the obscurity of the diagnosis; no crepitus being felt while the arm was applied to the side and the head of the bone drawn tightly up into the socket by the irritated muscles. These, being relaxed by ether, disclosed the nature of the accident.

CASE CXC. — *Ununited Fracture of the Humerus. Seton. Cure.* — A man, 55 years of age, was brought to me by his physician, in the latter part of May, 1859, with an ununited fracture, situated about the middle of the right humerus. The fracture had been caused six months before by a cart running over the arm. It had been treated in the usual way, by splints; but the ends of the bone had failed to unite, and the limb in consequence was useless: the fore-arm was flexed on the arm, and the elbow was more or less stiff. There was complete flexibility of the arm at the seat of fracture, so that I had great doubt as to the success of any operation.

This case being an appropriate one, I determined to try the seton. The fracture was oblique; the lower fragment lying directly anterior, the upper posterior. An instrument traversing the fissure, between the two fractured ends, was liable therefore to strike upon the bundle of vessels and nerves which lay directly against the internal line of fracture, rendering some caution necessary in the management of the operation, which was done as follows:—

A long incision, corresponding to the line of fracture, was made directly behind it; and, by dissection, muscular fibre was exposed. This being satisfactorily ascertained by the point of the finger, and the vessels pulled forward out of the way, the seton-needle, threaded with a skein of silk, was forced between the fractured ends of the bone, and through the muscle and skin of the opposite side. A free rush of arterial blood followed the passage of the instrument; indicating that some arterial branch, of considerable size, had been wounded. A folded towel was now placed over the wound; and firm compression made, by means of a roller, from the hand to the

shoulder. The patient was placed on his back in bed; and the arm elevated on a pillow in the bent position.

He passed a pretty comfortable night, and had no bleeding. The bandage was removed; but the cloth, which had become saturated with blood and dried, thus forming a clasp round the limb, was not interfered with, as it was found the circulation in the main vessel was well performed.

All the dressings were removed on the fourth day: the arm and fore-arm were placed in a gutta-percha splint, well moulded to fit the inside.

No constitutional irritation of any consequence followed the operation, or any purulent deposit, such as I have frequently witnessed. On July 20th, after the seton had been in place thirty days, there being some indication of this occurrence, the seton was withdrawn. The wounds at once rapidly healed; and on the 24th, an examination being made, the bones were found firmly united, and he was allowed to lay aside his splints, and go about with a sling.

Shortly after this, an attempt having been made to overcome the stiffness of the elbow, which had remained firmly flexed since the treatment for the accident, the mobility at the seat of fracture was again felt. The splints were therefore re-applied, when union again became firm; and it was determined to make no farther attempts until the lapse of time should have insured the bony consolidation of the humerus. This point is worthy of notice, as I have twice seen a fresh union in the femur destroyed by attempts made to overcome the stiffness of the knee-joint.

CASE CXCI. — *Fracture of the Lower End of the Radius, with other Fractures. Death. Autopsy.* — 1851. A man, 30 years old, was brought into the Hospital, having fallen a distance of forty feet through a scuttle to the floor. The following is from the Hospital records:—

"At entrance, at 6, P.M., there is fracture of the right radius, apparently just above the joint. There is great deformity, simulating dislocation of the wrist backwards. Crepitus distinct.

"The right leg is shortened, by measurement, one and a

quarter inches. It is everted, with edge of foot lying flat upon the table. There is distinct crepitus at or near the cervix femoris. When pressing the two iliac crests, they yield sensibly, and give a feeling of indistinct crepitus." He died at 10, P.M.

At the autopsy, the following were some of the pathological appearances exhibited: The right radius was fractured transversely, half an inch above the joint, with a comminuted fracture extending into the joint. The internal lateral ligament was torn away from its attachments to the ulna, carrying a bit of the bone with it.

The right femur was the seat of a comminuted fracture through the trochanter; and a longitudinal fracture of the shaft of the bone extended from its cervix downwards for four inches. Neither of these fractures communicated with the capsular ligament.

The right sacro-iliac synchondrosis was torn asunder, and the bones forming it fractured. The ramus of the ischium and pubes was fractured. The lower half of the sacrum and os coccygis were comminuted.

Remarks. — The fracture of the lower extremity of the radius is an accident of peculiar interest to surgeons from the liability to deformity, in spite of the best-directed treatment. The various apparatus invented by distinguished surgeons, with the object of preventing this deformity, show the importance attached to it. From simply regarding the external appearances presented by this fracture, it was formerly supposed that the bones yielded in an oblique direction: but observation of pathological specimens has shown that it is, on the contrary, almost always transverse; the peculiar deformity arising not so much from the overlapping of the fragments, as from the direction of the displacement by muscular action. Dr. Smith, of Dublin, in twenty specimens which he examined, found the fracture to have a transverse direction in eighteen. In the present instance, it was transverse.

CASE CXCI. — *Fracture of Arm, with Subsequent Deformity. Restoration by Force after Six Months.* — The following is an instance of the length of time at which an an-

gular deformity from fracture may be remedied in a young person. The patient was partly under my charge, and partly under that of one of my colleagues. A boy, 16 years of age, entered the Hospital on the 9th June, 1863, who, six months before, had fractured both bones of the fore-arm, near the middle, by a fall. Splints were applied soon after the accident; and, when they were removed, at the end of five weeks, the fracture had united, but the arm was crooked. This deformity had increased, and the usefulness of the arm was impaired by it.

There was a large callus at the point of fracture. The deformity was of two kinds; consisting of a partial fixed pronation of the arm below the fracture, and an angular curvature in the sense of flexion. Straight splints, well padded, were applied on the flexor and extensor surfaces of the arm, and firmly secured by bandages.

The use of these splints, variously applied, was continued for one month, at the end of which time the arm was a very little straighter. The patient, being dissatisfied with the slow progress of the cure, although it was gradually effecting the object, on the 10th of July was etherized, and the arm forcibly straightened. The ordinary spoon-shaped splint, with a roller bandage, was then applied. In a little more than a month after the operation, the shape of the arm was found to be normal, and the fracture quite firm. He was discharged from the Hospital, with orders to continue the use of the splints for some time. On the 12th of September, the fractured arm was as strong as the other, and perfectly straight.

FRACTURES OF THE PATELLA. — For many years, I used the ordinary methods proposed by Sir Astley Cooper, Boyer, and others, for the treatment of fractures of the patella, such as mechanical contrivances made of wood, or powerful straps placed above and below the fractured ends, which were approximated by screws, straps, strings, or bandages; and I was always struck by the great pain and swelling produced by their application. They seemed to act principally on the skin, even when applied in a moderate manner, so as not to produce in-

jury of the integument. If they had any mode of acting on the broken bones, it was to depress their edges, and throw the fractured faces forwards. This idea has since been verified by observing one or two specimens in the Museum of the Boston Society for Medical Improvement, collected by the distinguished pathologist, Dr. J. B. S. Jackson. Seeing the results by the old method, it occurred to me to trust almost entirely to position; the only accessory means employed being a broad strip of adhesive plaster, with a hole in the centre large enough to receive the patella, which is applied after the inflammatory symptoms have subsided.

My plan of treatment has been this: Immediately after the accident, the patient is placed on a bed, his leg raised on an inclined plane, to form an angle of about 45° with his body. A cradle is now placed over the foot, to prevent the contact of the bed-clothes; and compresses are placed over the injured part, wet with some cooling lotion. In case of any great inflammatory action, leeches are applied; but this has very rarely been necessary. At a later period, when pressure can be borne without any uneasiness, a strip of plaster, arranged as above, after being well warmed, is nicely adjusted on the thigh by one end. The upper fragment of the patella is then engaged in the opening, slowly dragged down, and the other end of the plaster is then made to adhere to the front part of the leg. Circular straps may be used if necessary. The comfort of the patient is immeasurably great, compared with the tormenting applications formerly used; and the success of the treatment is quite as good. Still, it is somewhat doubtful, whether, in most cases, the fracture would not do quite as well, placed in a ham splint, gently supported by bandages without elevation. In fact, I have tried this plan a number of times, and with good success.

The late Dr. A. A. Gould, a number of years since, at the time when I was first trying the method by position, reported to the Society for Medical Improvement the case of a patient whom he had treated by keeping the limb suspended, at an angle with the body, from the bedpost, without bandages, which was followed with gratifying success.

During the year 1858, having had a number of cases under my care, out of the Hospital, in which I was able to follow their progress, I was somewhat struck at the various periods at which patients recovered the use of the limb, after the accident; and found it much longer, in most cases, than was generally supposed. In order to obtain information on the subject, I proposed the question at one of the meetings of the Society above mentioned, and found from the experience of other medical men, that some of their patients had recovered in about three months; others required one or two years before the stiffness was lost, and power of flexion restored: one case was mentioned in which the power of the limb never returned, and the patient was obliged to go about on crutches. The recovery of the free motion of the limb did not correspond in these cases with the completeness of the union of the separated fragments; some of them doing remarkably well with quite a long ligamentous union.

I propose to illustrate the above observations by a number of cases which have come under my care, treated by various methods.

CASE CXCIH. — *Fracture of Patella.* — A young lady, about 25 years of age, while bathing in the sea, in attempting to lift up a child, felt a sudden snap about the knee, and immediately lost the power of supporting herself. She was assisted out of the water, and taken home; when the left patella was found to have been broken, and the fragments separated from one to two inches. I saw her a few hours afterwards. She was directed to be placed on her back, the leg and thigh to be slightly elevated, and a compress, wet with spirit and water, to be applied over the joint. Being somewhat delicate and dyspeptic, her food was ordered to be carefully regulated; and, to partially obviate the ill effects of confinement, she was bathed over once a day with warm salt water, followed by moderate dry friction.

After the first or second day, finding no undue inflammatory action about the joint, and even fearing a want of action, the wet applications were discontinued, and the limb placed in a hollow splint, more fully to prevent flexion.

This patient was confined about six weeks before the union seemed to be sufficiently firm to allow her to get up. She was then permitted to rise; a small splint of gutta-percha being placed at the back of the joint to give it support. This was removed daily, and gentle flexion given to it. Finally, at the end of nearly three months, she was able to bear her weight on the limb, and go out supported by a cane and crutch.

About eighteen months after the accident, although every means such as frictions, lubricating the part with ointments, and as much flexion as could be made without danger of breaking the intervening ligamentous union, had been applied, she was still unable to bend her leg farther than at a right angle. The separation of the fragments was from a quarter to half an inch. Once during this period, apparently from a peculiar state of the constitution, she had an attack of synovitis in that knee; the other knee-joint being, at the same time, a little tender.

This accident, it should be observed, occurred in a lady of very delicate constitution. The limb, from the first, was unrestrained by bandages; pretty early flexion was used; and yet, at the end of a year and a half, the limb could not be completely bent. The treatment above described, of frictions and gentle flexion, was continued, and, two years after the injury was received, she entirely recovered the use of her limb.

CASE CXCIV. — *Fracture of Patella.* — At the same time that I had the preceding case under my care, a young woman, about 25 years old, of powerful make, acting as servant in a friend's family, was brought into the Hospital, and came under my care. Having fallen the day before, while descending the stairs, she struck her knee, and produced a fracture of the patella. She was placed on a fracture-bed, the lower portion of which supported the injured limb, elevated at an angle of about 30° . Her head and shoulders were also slightly elevated in the same way. Cooling applications were placed over the fragments, which were left entirely unrestrained by any bandage. She was confined by the accident about two months; and, when she left the Hospital, the fractured ends were separated about half an inch.

I saw this patient a number of times afterwards. At the end of six months from the accident, although the union was perfectly good, and all the appropriate means had been used to gain the use of the joint, she still required a very firm-laced bandage, supported laterally; was unable to bend the limb so as to pick up any thing from the floor, and was obliged to walk with the support of a cane.

CASE CXCV. — *Fracture of Right Patella; Subsequent Fracture of Left.* — A man, aged 33, a mechanic, fell, Jan. 7, 1857, on the ice, and fractured his right patella transversely; the fragments being separated about an inch. He suffered but little pain from the injury when brought into the Hospital. He was put upon the inclined fracture-bed, and treated at first in the same manner as the preceding cases; strips of adhesive plaster being used after the inflammation had subsided. He was discharged well, on March 22d, the fragments being separated about a third of an inch.

On Nov. 22, 1858, he was again brought into the Hospital, having had his left knee struck by an iron bar, which produced a transverse fracture of the patella; the fragments being separated about three-quarters of an inch. His leg was placed on a Goodwin's splint, and much elevated.

On Feb. 1, 1859, there was good ligamentous union, with separation of about one-third of an inch; and he was allowed to get up, the limb being supported by a bandage. On February 20th, some slight separation of the fragments was found to have taken place. On March 1st, no further separation had occurred, the space between the fragments being about half an inch.

An examination of the other limb of this patient, the patella of which had been broken nearly two years before, disclosed the fact, that the fragments had been separated in an extraordinary manner at least three or four inches. He said that, on leaving the Hospital, he had used the limb without any precautions. In consequence, the fragments gradually became separated, and he finally lost the power, almost entirely, of extending the limb; so that, in walking, it was necessary to lift the leg from the ground, and give it a jerk forwards by a slightly lateral motion.

Moreover, if extreme care was not taken in managing the joint, by walking with the head and shoulders bent forwards so as to throw the centre of gravity rather in front of the knee, the joint would give way, and throw him upon the ground.

CASE CXCVI. — March, 1859. A man, 30 years of age, consulted me for an injury of the left patella, which, he said, had been fractured twelve years before; and for which he had been treated at the Hospital in Dublin, and had a good use of the limb since. The day before I saw him, he had fallen, and felt something give way about the knee; and supposed he had met with the same accident a second time.

I found what appeared to be at first a vertical fracture of the patella. But, on more careful scrutiny, what seemed to be a fissure in the bone proved to be made by a projection of the outer condyle of the femur in apposition with a very small patella of less than half the natural size.

On examining the right limb, in order to make a comparison, I found not the slightest traces of any patella. The joint, in fact, could be fully explored; and seemed only to be covered by skin, fascia, and capsular ligament. The patient said that the motions of the joint were perfectly good; and that the only explanation he could give was, that, when a child, he had an extensive suppurating sore over the knee-joint, following small-pox.

For the present injury, attributing it to the rupture of adhesions, I advised him not to confine himself, but to have a knee-cap well adjusted, to afford the limb support. He presented himself, some days afterwards, with this appliance, walking with ease, and only embarrassed on mounting a staircase.

CASE CXCVII. — *Fracture of Patella.* — March 16, 1859. A man, aged 40. This patient was in the Massachusetts General Hospital four years before, with fracture of both thighs, from which accident he completely recovered. To-day, he fell downstairs, and struck directly on the right knee. The patella was found to be broken into three pieces, with but little separation of the fragments however. He was immediately placed in bed, with his limb resting on an inclined plane.

During the treatment of the case, there was but little pain, although considerable effusion took place. The recovery was excellent.

CASE CXCVIII. — *Fracture of Patella.* — March 17, 1859. The patient, a man of 60 years, fell from a hay-mow, and struck his left knee on the barn floor. There was a fracture of the patella, with very great effusion.

He was placed in bed, with his leg resting on an inclined plane. The case went on to a favorable termination.

CASE CXCIX. — *Rupture of the Tendon of the Quadriceps Extensor Femoris Muscle, just at its Insertion into the Patella.* — In connection with fracture of the patella, the following case may be given. It was treated by position about the same time that I began that treatment of fractures of the patella, and is of very rare occurrence.

A man about 60 years old, subject to rheumatism, while sweeping the pavement on a frozen surface, slipped; and, in endeavoring to recover himself, felt something give way about the knee-joint, and at once fell to the ground. When brought into the Hospital, it was found that a wide gap existed between the quadriceps tendon and the patella, the skin being depressed at that point, so that the knee-joint could be completely explored by the finger. The patient was placed on his back; and the leg elevated at an angle of about 45° from the bed, and supported on an inclined plane, and cooling lotions applied to it. Much swelling and effusion into the joint followed; and, as no advantage could be perceived from the use of bandages, they were laid aside. Union gradually took place between the tendon and patella; and, after a treatment of a number of months, he finally recovered a good use of the limb.

I have seen three or four instances of persons who, having received a blow just below the patella, failed to recover the use of the leg. On a very careful inspection, a transverse crack, or rupture, was distinguished, partially dividing the fibres of the ligamentum patellæ. There was no other appearance or symptom to explain the loss of power over the leg. These patients

did well after a confinement of from three to six months in a ham splint.

CASE CC. — *Fracture of the Pelvis, with Rupture of Bladder.* — A man, 30 years old, died on his way to the Hospital, a bank of earth having fallen on him an hour before. The following were the appearances presented by the body: A fulness was observed in the right iliac region. The perinæum was somewhat fuller than natural to the right of the median line. The left side of the pelvis appeared drawn up, so that its spinous process was above the level of the right spinous process. The right lower extremity was, by measurement, one-half an inch longer than the left. On examination of the pelvis, a fracture was detected near the symphysis pubis; also one through the left sacro-iliac synchondrosis. By rotating the left lower extremity, the left ilium was freely movable, with some crepitus attending the motion. Powerful flexion of the right lower extremity produced an indistinct crepitus in the joint.

A catheter was passed, with some difficulty, through the urethra; and its point could at once be distinguished in the cavity of the abdomen.

Permission being obtained, the autopsy was made five hours after death, by Dr. F. J. Bumstead, then house-surgeon at the Hospital, who drew up the following account of it: —

“ On cutting into the peritoneal cavity, it is found to be entirely filled with blood. Its posterior wall is covered with a dark-colored ecchymosis, and is raised by a large effusion beneath. A small hernia of the tissues, external to the peritoneum, about the size of the little finger, protrudes through the membrane, back of the right os pubis. The confused state of the parts beneath the peritoneum renders a minute examination impossible. The blood has undermined the peritoneal cavity, and infiltrated the iliacus and psoas muscles.

“ The bladder is ruptured to the extent of an inch above the triangular ligament, and posterior to the symphysis pubis. The diagnosis of fracture through the symphysis, and through the left sacro-iliac synchondrosis is found to have been correct. The fragments of the latter are separated to the width of a finger. In addition, the right acetabulum is crossed by several fractures, which extend through the ischium and ilium, entirely isolating several pieces of bone. From

the fundus of the acetabulum, a triangular piece of bone has been drawn inwards, and the corresponding surface of the head of the femur is crushed to the depth of one or two lines. Ligamentum teres not injured."

CASE CCI. — *Fracture of the Neck of the Thigh-bone in a Gentleman Ninety Years of Age. Recovery.* — The gentleman who was the subject of this case was a person of the most energetic character; his health had never been abused by any excess, and he had always lived with the utmost simplicity. His mind was of great activity, and he had occupied many positions of distinction and trust in the State and country.

His case was particularly interesting to myself from his having been brought into professional relations with five members of my family, during a period of ninety years.

The fracture was produced by a fall from his chair, Dec. 11, 1861. He was unable to rise, and was placed upon a mattress, on the floor, in which position I saw him half an hour afterward.

The limbs were found of an equal length, and there was no eversion of the foot. On gentle rotation of the limb, with a finger in the groin, a distinct crepitus was observed. The trochanter rotated with the shaft of the bone.

About six hours after the accident, a fracture-bed, with a triple inclined plane, having been obtained, he was placed upon it. Before this was done, it was found that the foot was everted, and the limb shortened between one and two inches. After being kept in this position about two weeks, he began to be uneasy; complained of some soreness of the back, in spite of every precaution which had been taken, and spasmodic actions in the extremities manifested themselves. He was then moved to a new bed, which I had contrived for the purpose, consisting of a triple inclined plane, placed on a second plane, with which, by a ratchet movement, the patient could be brought up into a sitting posture without disturbing the fracture, and the pressure brought more on the tuberosity of the ischium and thighs. By the use of this bed, his condition was much improved; and, in

the course of the winter, he recovered the use of the limb, with some shortening and eversion.

During the treatment, he once or twice fell into a somnolent state, in which he remained two or three days, the pulse becoming extremely slow; and fears were entertained that life would cease in one of these attacks. On coming out of them, however, his vitality was gradually restored.

He lived about a year afterwards: and finally died quietly without any marked symptoms of disease.

CASE CCII. — *Fracture of the Upper Part of the Shaft and Neck of the Os Femoris, in a Lady, aged Eighty-six. No Crepitus. Death in one Week. Autopsy.*—1854, Jan. 9. This patient, about a week before her death, fell in her room, striking on the trochanter of the right thigh-bone. She was unable to rise, and was taken up and placed in bed. On examination, it was found that the right lower extremity was shortened about an inch, and the foot everted. The thigh was much swollen. No crepitus could be discovered on any motion given to the limb. She was placed on her back; the limb supported on a double inclined plane, made of pillows. She complained of but little pain in the injured part. For a few days she did well. The bowels then became constipated, the pulse failed gradually, and she died on the sixth day from the reception of the injury, apparently from the shock to a system reduced by age.

On a post-mortem examination, before the injured parts were exposed, an attempt was made to obtain crepitus; but none was produced by the ordinary motions of the limb. By extreme flexion, however, using at the same time powerful rotation, a crepitus could be distinguished. On making an incision over the trochanter down the thigh, the fat and muscles were found filled with extravasated blood. There was a comminuted fracture of the shaft of the bone, just below the trochanter; and another fracture extending upwards from this as far as the edge of the socket, separating the neck of the bone from the trochanter. But little blood was effused into the cavity of the joint.

This case is worthy of remark as showing how extensive a

fracture may be; and yet, from the extravasation of blood, and from other causes, one of the principal diagnostic signs of fracture, crepitus, not be obtained.

CASE CCIII.—*Fracture of the Neck of Thigh-bone, in an Old Lady One Hundred Years and Six Months old. Inversion of Foot. Death three Weeks afterwards. No Union of Fracture. Solid Collection in Rectum.*—The old lady who was the subject of this notice died January, 1837, after a long life of uninterrupted good health, aged 100 years and 6 months; her death being finally accelerated by a fracture of the hip, which occurred a few weeks previously. For a year, she had been subject to some aberration of mind, which required her to be somewhat restrained in her motions; and, as she had a constant desire to leave the house, her clothes were taken from her, and she was confined as much as possible to the bed. Three weeks before her death, while left by herself, she was heard by the persons in the room below, to get out of her bed; and, while walking across the room, to fall heavily on the floor. Upon going into her chamber, she was found prostrate, and unable to rise. She was immediately carried to her bed, her medical attendant called, and, an examination being made, it was discovered that a fracture had taken place through the neck of the thigh-bone.

There was but little displacement of the fractured parts, the limb being a little shortened and the foot inverted; and it was determined, therefore, that the application of any apparatus for confining the limb would be unnecessary, position only being relied upon for the union of the bone. She was directed to lie upon her back; and a pillow was placed under the thigh, so as to keep it slightly flexed on the pelvis. She died about three weeks after the accident; her death taking place without suffering, and apparently occasioned by the combined effects of the accident, and the confined position necessarily attendant on it. It may be well to state that the senses of the old lady remained perfect to the last. Her hearing was good, and she was able to read the smallest print without the use of glasses.

The body was examined twelve hours after death, and pre-

sented the following appearances: Stature small, about five feet; very little emaciation. On the lower part of the sacrum was a gangrenous spot, two inches in diameter, occasioned by the long pressure on that part from her confined position. The left lower extremity was shortened perhaps a quarter of an inch, and the toes slightly turned *inwards*. Upon opening the head, about a gill of serum escaped from the cavity of the dura mater. This membrane was strongly adherent throughout to the cranium, requiring the use of much force to separate it from its attachments. The superficial vessels of the brain were much distended with blood; its substance of good consistence, offering otherwise nothing remarkable. All the sutures of the cranium were completely ossified. The cartilages of the ribs were not ossified, as is usually the case in old persons, and were easily cut through with the knife.

The lungs were of a dark-blue color on the left side; at the summit, strongly adherent to the ribs; and, at this point, a conglomeration of small semi-transparent granulations were found embedded in the substance of the healthy lung. These granulations were scattered throughout the lung; but at no point was there any appearance of cicatrices or tubercles in a softened state. The edges of the lower lobe of the right lung presented the most marked appearance of emphysema. The heart was small; its cavities filled with black, uncoagulated blood. The free edges of the valves of the aorta were not ossified: at their bases, however, and at that part of the aorta opposed to their edges, were two distinct osseous rings. Patches of osseous deposits, some of them an inch in diameter, were scattered at intervals throughout the whole course of the aorta. The liver, kidneys, and spleen were perfectly healthy, and of the natural color and consistence. The stomach was remarkably small,—its calibre about the same as that of the duodenum, from which externally it was difficult to distinguish it,—and presented much the appearances I had observed about a year before in the stomach of an old lady who had destroyed herself by starvation, with this exception, that, in the latter case, the mucous coat was much more corrugated. The intestines were generally of small size; at some points, in the large

intestines, not being more than half an inch in diameter. At the rectum, however, a very remarkable phenomenon presented itself.

The intestine was here dilated into a large pouch, completely filled by a ball of hardened fecal matter, which, occupying the whole cavity of the pelvis, forced the bladder completely out of its natural situation; below, this mass was found pressing down on the perinæum, and slightly dilating the anus. From all appearances, this ball must have been for a long period in the situation in which it was discovered, as she had complained of no suffering, and the bowels had been perfectly regular up to the day of her death. The matter evacuated of course passed down at the sides of the obstruction.

The bladder was large; its mucous coat somewhat reddened, and rather softer than natural. The uterus was about the size of a hazel-nut; and, on cutting into it, a small quantity of pus, apparently of recent formation, escaped from its cavity. Nothing remarkable was observed about the ovaries, either as to size or consistence. Upon examination of the hip, it was found that a fracture had taken place at that part in a very remarkable manner. In the first place, a fracture extended from the trochanter transversely through the neck of the os femoris; in the second place, the trochanter major was completely separated from the body of the bone. The displacement of the fractured portions, however, was very slight; they being interlocked by irregular serrations, although freely movable on each other. The trochanter minor was nearly split through. There appeared to be no attempt at union.

The remarkable features of this case are: First, the inversion of the foot; second, the want of ossification about the ribs, which would naturally be expected in a person of such advanced age; third, the small size of the stomach; fourth, the great mass of hardened feces in the rectum, allowing, nevertheless, the regular passage of matter at the sides, so that, previous to death, nothing of the kind was suspected. A case in which a similar collection took place is given in one of the numbers of the "London Medical Gazette." The patient was a lady seventy years of age, who had suffered for some time with most

excruciating pains in the lower part of the rectum. These pains were periodical, and similar in their character to the bearing-down pains of labor. An examination being finally made, it was found that a large mass of hardened feces, of the size of the head of a full-grown foetus, was pressing down upon the perinæum; the anus being distended to the size of a crown-piece. This mass was broken down with the handle of a spoon, and the sufferings of the patient immediately relieved on the removal of the obstruction. Nothing of the kind had been suspected, as the patient had always enjoyed a regular state of bowels. I have met with a similar instance in the case of an insane person, also in the case of a fracture of the neck of the thigh-bone in an old gentleman, hereafter to be related; in both instances requiring a prolonged operation with the scoop which accompanies lithotomy instruments, for removal.

The inversion was caused by the serrations becoming interlocked; the blow breaking the bone, and at the same time giving it a twist inwards, in which position it was retained, as above described. In conclusion, it may be observed that the bones were not more brittle than is ordinarily found in persons of forty or fifty years of age.

I have in my possession a specimen of intra-capsular fracture of the neck of the femur, with *inversion* of the foot, occurring in a lady ninety-three years old. It was presented to me by the venerable Dr. Alden, of Randolph, under whose care the patient was.

CASE CCIV. — *Intra-capsular Fracture of the Cervix Femoris. Death from Intestinal Strangulation.* — Dec. 1850. A gentleman, 83 years of age, fell upon a carpeted floor, striking the right trochanter. When taken up, he was found to be suffering severe pain: the foot was everted, and the limb shortened half an inch. He was placed on a triple inclined plane fracture-bed; the foot being supported by means of pillows, and protected by a cradle. At the end of seven weeks, he was able to move the leg without pain, and the foot was not disposed to evert.

On Jan. 30, 1851, he was seized with a pain in the epigas-

trium, accompanied by vomiting. The pain was relieved on the 31st; but the vomiting continued, at intervals, until his death, which occurred on Feb. 4th. During this period, there was no pain on pressure over any part of the abdomen, and no tumor was perceived. One evacuation, of a solid consistence, took place from the bowels, by means of an enema, on the 2d of February. The urine was suppressed for twenty-four hours; afterwards, it was passed naturally.

On examination after death, it was discovered that about eighteen inches of the ileum, in the neighborhood of the cœcum, had passed through an aperture in the circumference of the omentum, apparently made by an old adhesion: all this portion of the intestine was black, but not in a state of gangrene, the strangulation being partial. The capsule of the hip-joint being opened, there issued a small quantity of dark-colored blood. A fracture was at once seen, passing transversely through the neck of the bone. The parts, however, were firmly interlocked; and it was only after efforts of forcible rotation were made, that they partially separated. A portion of the periosteum, at the back part of the cervix, remained entire. The effects of the fracture were to produce a slight shortening of the neck of the bone, by the fragments being driven, as it were, one into another; and an additional shortness of the limb, from the partial drawing-up of the shaft of the bone by muscular contraction.

In the following case, the patient walked some distance after a complete fracture of the neck of the thigh-bone within the capsular ligament. He never would submit to any systematic treatment, not thinking his hip broken, and never recovered the use of the limb. He died two years and a half afterwards, with a cerebral attack, attendant on a suppression of urine. The case has been fully described by Dr. J. C. Warren, under whose care he at first was, in the American edition of Cooper on "Dislocations and Fractures," and is accompanied with a woodcut. For the last year of his life, he was under my care.

CASE CCV.—*Fracture of the Cervix of the Os Femoris, within the Capsular Ligament; with a partly Osseous, and partly Cartilaginous Union. Locomotion after Injury.*—

"The patient was a gentleman of education and talents. He studied medicine in the early part of his life, but afterwards left it for another profession. A constitution naturally weak, and impaired by disease, gradually gave way; so that, at sixty, he had the appearance of decrepitude. He however continued to go out and attend to some business, till he reached the age of seventy, when he met with a peculiar accident.

"Being a member of the Massachusetts Senate, he was in the act of ascending the steps of the State House, for the purpose of taking his usual seat with that body, when he fell, and struck on the left trochanter. On arising, he found himself quite lame, though able to stand and walk. In this condition he went up the steps, and entered the House, where he remained an hour and a half, and made two or three speeches; during the last of which he was obliged to sit down, leaving it unfinished. A carriage being called for, he was sent home, and I was requested to visit him.

"I found him in his parlor, sitting on a sofa, with his feet on the floor, as if nothing had happened. He described the accident, and I directly came to the conclusion that he must have fractured the neck of the thigh-bone.

"On examining the injured limb, I found no appearance of distortion, deformity, or any other change. It was of exactly the same length as before the accident (having been rendered half an inch shorter than the other by an injury of the knee, received at an early period of life). It had the same direction with the other. He could stand on it, but not walk without suffering. There was no appearance of any detached fragments of bone about the articulation: the trochanter was perfectly sound, and in its place. There was, at that time, no tenderness in the groin, nor any inequality. The passive movements which I employed produced no pain, with the exception of strong rotation outwards, and strong flexion of the thigh upon the pelvis. These movements produced some degree of pain, but not very considerable. There was no crepitus."

.

Post-mortem Examination of the Seat of Injury. — "The muscles about the thigh were thin and wasted: the capsular

ligament was thickened, but regular on the outside. On cutting into the articulation, there was no appearance of recent inflammation; the neck of the thigh-bone was absorbed; just at the edge of the articular surface was a slight rising of the bone, scarcely visible to the eye, but perfectly sensible to the touch, which indicated the seat of the fracture. When the attempt was made to move the shaft of the bone upon the head, no motion between them could be perceived. A vertical section through the head and neck of the bone was then made: the place of the fracture was thus found to be indicated by a white line running across the neck of the bone, and having the thickness of the thirtieth of an inch. In one of the fractured sections, no motion could be produced between the head and neck of the bone; in the other, slight motion existed. The preparation is in the Warren Museum."

DISLOCATIONS.

Dislocations are nearly as important to the surgeon as fractures. I do not propose to go into any detailed description with regard to them, but only to make a few remarks on certain points which have seemed to me to be of special importance.

As a general rule, dislocations are rarely produced by a direct blow on the joint. Where they occur from this cause, they are usually accompanied with a fracture.

I have never seen, nor do I know of, a case of simple dislocation of the hip-joint produced in this way. Dislocations of the shoulder-joint are described by authors as taking place either by falls on the elbow or hand, or from a direct blow on the shoulder. Mr. Bryant, in Cooper's "Surgical Dictionary," states, that, "in thirty-one out of thirty-four cases, the cause of the injury was a *direct fall* upon the shoulder, either forwards, backwards, or outwards. In two instances only of dislocation downwards, and in one of dislocation downwards and forwards, was the bone displaced by a fall upon the extended arm." M. Malgaigne says, on the contrary (p. 462 of his work on Dislocations), speaking of one of the most common dislo-

cations, — the one under the coracoid process, — as follows : “ Finally, in very rare cases, the sub-coracoid dislocation is the effect of a direct blow on the shoulder, the arm not being raised. Richerand appears to have observed one case in a quarryman, who, surprised by a caving-in of earth, struck the external part of the shoulder against a pillar of a gallery ; but we shall see that these sorts of falls produce particularly incomplete dislocations, and especially infra-coracoid dislocations ; and perhaps that of Richerand belongs to one or the other of these two categories.”

The error, probably, which has arisen, in speaking of these dislocations induced by a blow on the shoulder, is in not stating whether the arm is applied to the side, or raised at an angle from it. In the former position, it would seem almost impossible, by a blow from above, to drive the head of the bone down below the socket. In almost every case where I have seen dislocations occur from a fall on the shoulder, the arm lying at the side, — as in persons who fall, like the intoxicated, without an effort to save themselves, — a crepitus was found to accompany the replacement of the head of the bone, which was easily displaced again after reduction, as if the support from the front part of the socket had been broken away. In one case of dislocation, under the clavicle in front of the coracoid process, which is said by Malgaigne to be produced by a blow on the shoulder, the man was jammed between two heavy freight-cars, which doubled him up, as it were, dislocated his shoulder forwards, fractured the collar-bone in three or four places, and fractured his ribs, driving them into his lungs. The head of the bone was replaced before I saw him ; but, learning the way in which the accident was received, I made investigation to see if crepitus was present, and found it, but not very marked.

Dislocations of the elbow-joint usually result, so far as I have observed, from falls on the hand, or violent twists of the fore-arm, blows on the back of the elbow-joint producing fractures, or fractures accompanied with dislocation.

Dislocation of the knee-joint, unless it is a compound one, I have rarely seen. Of displacement of the semilunar cartilages of the knee-joint, I have seen a number of instances.

They have occurred from a twist of the limb, or from catching the foot in the carpet: and I have always replaced them by flexing the thigh on the body, the leg on the thigh; then, by giving a lateral or jerking motion to the joint, and suddenly straightening it, the cartilage has gone into place.

In dislocations of the outer end of the clavicle, I have not witnessed much success in the treatment, nor much ultimate weakness of the arm by its remaining out of place, although its too free play may be a source of discomfort. Dr. Folts, of East Boston, has suggested a modification of Bartlett's apparatus for broken clavicle, as a remedy for this accident, which is effected by an additional shoulder-strap over the injured shoulder.

I would mention here the following symptom, which is very frequent after recovery from dislocations of the shoulder-joint; and, in fact, other accidents in which the deltoid muscle is involved. It is the want of power in raising the arm above a certain angle, which so frequently follows. I have often seen patients many months, and sometimes years, after a dislocation, who, having recovered all the other motions, are unable to raise the arm beyond an angle of 45° or 50° . In cases of straining of the shoulder, produced, for instance, by a person swinging himself off from a wharf to a ship, I have observed this symptom after a period of two years from the time of the accident, attended with much pain. In two instances, it was cured by keeping the limb at rest two or three months. In the early part of 1866, a lady consulted me for this reason, who, sixteen years before, was thrown out of a sleigh, and struck the upper part of her shoulder on the curbstone. She could elevate the arm to about 45° . It could be rotated freely inwards, to any extent, but scarcely any outwards. On the back part of the head of the bone, I discovered an osseous lump, which appeared to be the greater tubercle knocked backward.

"This," by the way, Malgaigne says, "is often broken when the head of the bone is driven forwards under the clavicle by a direct blow." Lately, this lady, while exerting herself in packing a trunk, felt something give way about the deltoid muscle, followed by an ecchymosis; showing, that, even after

this lapse of time, the injury to its fibres had not been repaired.

In following the wards of Lisfranc, in Paris, I noticed a number of cases of injuries of the shoulder-joint, which he considered anomalous, and which were supposed to be partial dislocations of the shoulder. These patients had all received their injuries by a blow upon the joint itself: the head of the humerus seemed to be displaced slightly forward, or as if on the edge of the glenoid cavity. It could be easily replaced by a slight effort, but was at once displaced when abandoned to itself.

Some time afterwards, I observed, in the "Medico-Chirurgical Review," a drawing of a case which had been considered one of partial dislocation, but in which it was shown that the front part of the socket had been broken off; thus allowing a slight displacement of the head of the humerus forward, and ending in the formation of a new socket a little in front of the old one.

About this time, a sailor was brought into the Massachusetts General Hospital, who had fallen from the mast of a ship, and had received fatal injuries. Among others, there was apparently a partial dislocation of the shoulder. On examination, a distinct ecchymosis was found on the external aspect of the joint; and the front part of the socket had been broken off, so that the head of the humerus lay partially below the coracoid process.

During several years in practice, before I fully understood the nature of the lesion, I observed cases of dislocation of the shoulder, in which, after reduction by the usual methods, the bone showed an unusual tendency to return to its former state of displacement. In these cases, I found, on a strict examination of the patient, that the injury had been inflicted by a blow upon the joint itself. Latterly, I have occasionally met with cases of recent dislocation which have been brought into the Hospital on account of the supposed failure to effect reduction, but in which the real difficulty lay, not in replacing the bone in its socket (which was very easily effected), but in retaining it there after the removal of the artificial supports. I suppose these cases to be fractures of the edge of the socket, or its cartilaginous ring, by a blow on the shoulder. It is difficult,

however, to prove this by anatomical investigation, our opportunities to do so being rare.

This fact is one of considerable practical importance. When a patient comes under our notice, with a recent dislocation of the shoulder-joint, he may be asked in what manner the injury was received. If by a blow on the shoulder, a bruised spot will generally be found; and, if an ecchymosis also appears within a short time, either in front of the joint or along the side of the arm, the diagnosis of a fracture may almost certainly be made. If, on the contrary, the patient has received the blow on the hand or elbow, with the arm at the same time more or less extended from the thorax, we may expect to find a simple dislocation; or, if there has been great violence, we may possibly find it complicated with fracture of the neck of the humerus. Impacted fracture of the head of the humerus, occurring from a blow on the shoulder, is the only injury likely to be mistaken for the so-called partial dislocation just noticed. Malgaigne mentions a displacement of the tendon of the long head of the biceps, as giving the appearance of partial dislocation.

The most important part of the treatment of dislocation of the shoulder, with fracture of the socket, consists in retaining the bone in position after it has been reduced. This object is well attained by the use of Fox's apparatus for fractured clavicle; the wedge-shaped pad in the axilla preventing the reproduction of the dislocation. In old cases, with complete displacement, considerable force is often required to break up adhesions, which are generally more tenacious than in cases of old simple dislocation; probably on account of the additional inflammatory action consequent upon the fracture of the socket. Greater care, and a longer persistence in the use of mechanical means, are also necessary to retain the head of the bone in its place while the new socket is in process of formation. In fact, I have seen the head of the bone displaced by a slight pressure with the thumb while being examined after reduction, the arm being at the time firmly bandaged to the body. In old dislocations, an entire loss of muscular power might also allow of this.

I have had to treat several cases of dislocation of the shoul-

der, with fracture of the neck of the humerus. In two instances in which I was called while the muscles were still relaxed, and before the patient had recovered from the depressing influence of the shock, it was found possible to effect reduction by making extension of the shaft of the bone, at the same time working the separated head into its socket by firm pressure with the thumbs. In case reduction cannot be thus effected, it is still a question whether the shaft of the bone should be carried back into the old socket, so as thus to make at once the best practicable joint; or whether it should be placed in apposition with the head, and an attempt made at reduction after such a lapse of time as may be thought sufficient for the union of the fragments to take place. The latter method was tried with success, by Dr. John C. Warren, on a young man, whose case he reported in the "Boston Medical and Surgical Journal" for 1828. Immediate reduction having been attempted in vain, fracture-apparatus was applied. After seven weeks, extension was made with pulleys, and the dislocation reduced. This case is quoted by Malgaigne, who considers the precedent worthy to be followed in similar cases. I also attempted the same treatment in a case which occurred nearly twenty years ago; but, in the attempt to break up the adhesions which had formed during the six or eight weeks that had elapsed, the callus gave way, and the fracture was reproduced. The broken end of the bone was then placed in the glenoid cavity, and the patient recovered with a very useful arm. In another case which came under my notice, the arm had been paralyzed by fruitless attempts at reduction. I saw the patient, in consultation with other surgeons, at the end of seven weeks, when it was decided to leave the broken end of the bone in the socket. I afterwards learned that the paralysis gradually passed off, and that the patient recovered the use of the arm.

Dislocation of the hip-joint, so far as my own observation goes, may take place upon almost any part of the pelvis in the immediate neighborhood of the acetabulum. During an attempt at reduction, made under ether, I have seen almost every kind of displacement imitated. In the course of my practice, I have had three cases of dislocations downwards and back-

wards; one of them in a boy of six years of age, the youngest patient in whom I have ever seen dislocation of the head of the femur. I have met with a dislocation of one thigh into the foramen ovale, the other thigh being dislocated upwards at the same time, with incomplete fracture of the neck of the bone; the fractured portions separating just as the head had been restored to its place in the socket.

I have only once seen a dislocation of the hip in the female, — a patient who came into the Hospital under Dr. Cabot, who reduced it; and I believe that there is but one such instance recorded in the work of Sir Astley Cooper on this subject. The rarity of this dislocation in women is a fact of great importance in distinguishing between fractures, and displacements of the head of the thigh-bone.

It is well known as one of the diagnostic marks of fracture of the neck of the femur, that the foot is turned outwards, and the limb shortened. In dislocation on the dorsum ilii, the limb is turned inwards, with a like shortening. As an exception to the rule in fracture of the neck of the thigh-bone, and as a point of resemblance to dislocation upon the dorsum ilii, I would refer to two cases already given of inversion of the foot in fracture of the cervix femoris in old women. I have also observed, in the course of the reduction of a dislocation on the dorsum, the toes become everted; the head of the bone taking a position in front, so as to present most of the appearances usually given by a fracture of the neck of the bone.

The use of ether has made a very great change in the practice pursued in the treatment of dislocations of the hip, which can now be very frequently reduced by manual assistance only, thus enabling us, in many cases, to dispense entirely with pulleys; and, by successive movements of flexion, abduction, and rotation, to restore the head of the bone to its socket with remarkable facility.

CASE CCVI. — *Dislocation of the Shoulder-joint of eight weeks' standing. Reduction.* — February, 1864. A woman, 42 years of age and in fair health, was taken, after the delivery of a healthy child, with severe puerperal convulsions, lasting

twenty-four hours. During this time, she was continually throwing herself violently about in the bed, unless restrained by attendants. After she had recovered from the convulsions, it was found that the left shoulder-joint was much swollen and bruised on its outer side, with an ecchymosis running down upon both the outer and inner sides of the arm. The arm was useless. At the end of six weeks, the swelling having subsided, it was discovered that a dislocation existed. Attempts were made, by manual extension, to reduce it, during which more or less crepitus could be distinguished.

From the history of the case, — that is, from the fact of there having been great swelling, attended by ecchymosis, — I suspected that a fracture must have existed in addition to the dislocation.

The head of the bone could be felt in the axilla, and, with the neck, seemed to be a little enlarged. Pulleys were applied, after the patient was thoroughly etherized; and, the adhesions having been ruptured by forcible rotation of the limb, after strong extension, an attempt was made to carry the head into its place. Much crepitus was felt; but the effort to restore the bone to its normal situation failed. The pulleys were again applied, and powerful rotatory motion given to the humerus, so as to carry the bent arm through three-quarters of a circle. The knee was now placed in the axilla; and, the pulleys being relaxed, the head of the bone was pried into place. The arm was then confined to the body by a bandage. On a slight pressure being made upon the head of the bone with the fingers, it slipped partially out of the socket; and this continued to recur whenever the bone was reduced, until it was prevented by placing a large pad in the axilla. This arrangement was adopted throughout the treatment, that is, until the lapse of about four weeks, when it was found that the size of the pad could be somewhat diminished. The patient then went home, with directions to continue the use of the apparatus until no farther disposition to displacement should exist.

October, 1864. — This patient consulted me again, now seven months since the reduction of the dislocation. She said that, once or twice after she returned home, the bone had slipped

out of place, but had been easily reduced; and she thought that it was not yet in its proper position, as she could not make all the usual movements of the limb. On examination, I found the shoulder nearly as plump and round as the other, and, in fact, a little more prominent, from the habit of carrying it elevated during the long course of bandaging to which it had been subjected. The whole limb looked healthy, and the use of it was good, with the exception of the motions of elevation and abduction, which we often see impaired for a year or more after a simple displacement of the bone, or even when the muscles have been injured by a severe strain, without any dislocation. It might be mentioned, that no motion imparted to the head of the bone could reproduce the dislocation, as was the case but a few months before.

CASE CCVII. — *Sub-coracoid Dislocation, probably Incomplete.* — A large, powerful young man, who said that he was but 16 years of age, although apparently nearly ten years older, presented himself at the Hospital with an injury which he had received fifteen days before, having fallen from a height upon the deck of his ship. He was unable to use the limb much, and could not raise it. He said there had been but little pain and no numbness, and that the blow had been received a little below the most prominent part of the shoulder. At the point indicated, or rather a little below it, was a slight discoloration. On the inside of the limb, in its lower two-thirds, was an extensive ecchymosis. Under the acromion, the head of the bone could not be felt, and the roundness of the shoulder was lost. The deltoid muscle, however, was not on a stretch, as is seen in cases of ordinary dislocation. On elevating the limb, and exploring the axilla, the head was felt, although rather indistinctly, and as if covered up by some plastic material. It lay directly under the coracoid process. The patient was advised to submit to an attempt at reduction, and was told, that, if he did not, the use of the limb would be impaired for life; but being very stupid, and suffering no pain, he declined to have the trial made.

This case appears to be one of those in which the head

of the bone seems to have been driven against the front part of the socket, breaking away its supports, and allowing the head to rest just in front of its natural position, forming there a new socket nearly on the edge of the old one. This injury is indicated, first, by the want of tension of the deltoid, which usually exists when the head of the humerus is caught under the edge of the socket; secondly, by the numbness met with, in most cases, from the pressure of the head of the bone upon the axillary nerves, where the dislocation is complete; and, finally, by the great ecchymosis on the inside of the limb, occasioned by the ruptured vessels about the injured socket, and which we do not often see, so far as my experience goes, in cases of simple dislocation of the shoulder. An attempt at reduction, in this case, would probably have resulted in the breaking-up of the adhesions which had formed; thus admitting of the replacement of the bone in its natural position, where, however, from the want of support, it would require the aid of mechanical appliances to retain it until a new socket should be formed about it.

CASE CCVIII. — *Dislocation of the Head of the Humerus forward, with probable Fracture of the Socket. Reduction.*

— The following case exemplifies two facts. The first, of which I have before given one or two instances, is, that when a blow is received on the shoulder, the arm being at the side, and not extended, producing a dislocation of the humerus, it is generally accompanied by a fracture; second, when a patient presents himself with a doubtful injury to the arm, the necessity of examining carefully the whole upper extremity.

A short, powerful Irishman, about 55 years old, applied for advice at the Hospital. Having requested the ward-tender to prepare the patients beforehand for examination, as there were a great many applicants, his shirt was removed. I at once perceived an unnatural condition of the shoulder; and, on examination, found the usual signs of a dislocation forwards. The patient said that he had fallen, about five weeks before, striking on an iron grating, producing a severe contusion, followed by an ecchymosis on the outside of the arm. I asked him if he had had surgical advice. He at first said no, but afterwards stated

that he had received advice from a physician at the time of the injury, and advice at the Hospital about three weeks after. On inquiry of the house-surgeon, I learned that the man had been there, and had stripped up his sleeve as far as the elbow, and shown me a swollen arm, upon which, he said, he had received a severe blow. A liniment was prescribed, and he was told to call again.

The patient was etherized, and the pulleys adjusted. The limb was then rotated, in order to break up the adhesions, which were heard to give way under the force applied. Considerable force was exerted before the head of the bone could be drawn outwards under the socket. The knee was then placed in the axilla, to serve as a fulcrum; and, the arm being used as a lever, the head of the bone was restored to its place. The extension was now relaxed; and, without moving the elbow from the side, I made a movement of rotation to ascertain the state of the socket. A cartilaginous crepitation was at once felt, and the head of the bone was again displaced. In old dislocations of the shoulder, this occurrence is not uncommon after reduction, if the arm is raised at an angle of from 45° to 90° from the body; but I have seldom known it take place from the simple act of rotation, unless a part of its supports had been destroyed. The pulleys were again adjusted, the bone returned to its socket, and the arm secured to the side by a bandage. The recovery was good, but prolonged.

CASE CCIX. — *Case of Dislocation of the Shoulder backwards, from Muscular Contraction. Reduction.* — This dislocation is one of great rarity. Sir Astley Cooper gives two cases as having occurred in his hospital practice in the course of thirty years; which, however, he speaks of as being dislocations on the dorsum of the scapula. M. Malgaigne has collected twenty-nine cases, eight of which were the result of convulsions, like the present case. Out of a hundred and fifty-nine cases of scapulo-humeral luxation recorded at the Middlesex Hospital, three are assigned to this variety. This case is the first of a dislocation of the shoulder backwards that I have seen at the Hospital. M. Malgaigne describes the dislocation under

the head of *outwards* and *backwards*. He also speaks of the difficulty of retaining the head of the bone. In one of Sir Astley Cooper's cases, it was found that the sub-scapularis muscle was torn away from its insertion into the smaller tuberosity of the humerus, so that the posterior muscles drew it backwards as soon as replaced in the socket.

The subject of the present case was a man aged 46. He entered the Hospital, June 29, 1866. Before he removed his clothes, finding the elbow applied to the side, and not standing out from the body, as in other dislocations of the shoulder, I doubted its being dislocation. On examination, the following appearances were presented : —

The coracoid process of the scapula was so prominent as to appear at first like the head of the bone. On the outside of this, the glenoid cavity was seen empty ; the acromion projected. Behind the acromion, and raised a little above its external angle, was the head of the bone, firmly fixed in its position. The arm seemed to be a little longer than the other ; but it was difficult to decide this by measurement. The fore-arm and hand retained their movements ; the arm itself could be carried off from the side only for a short distance, and its anterior and posterior movements were very limited.

The accident had occurred seven weeks before, during an attack of convulsions, followed by an apoplectic state ; and, on account of this critical condition, attention was not given to the state of the shoulder until some time afterwards. It was not known whether he received any blow on his shoulder during the convulsions ; but a slight ecchymosis was still visible at the bend of the elbow, and at the upper and anterior part of the arm.

The patient being etherized, the arm was rotated freely, to break up adhesions ; and, the scapula being fixed, an attempt was made to force the head of the bone into the socket, by carrying the elbow backwards, and prying the head forwards ; but it could not be stirred from its situation. The movements of rotation were now repeated, followed by powerful extension ; and, on a repetition of the same process as before, the head was detached from its position, and replaced in the socket. This was verified by an examination made by all the gentlemen present.

The arm could now be carried freely in every direction. The head of the bone was quite movable in the socket; and, on being seized with the fingers, could be easily displaced either forwards or backwards. This seemed owing partly to the entire loss of muscular power for retaining the head of the bone in its place; and, possibly, from an inflammatory action, or the tearing away of the attachments of the sub-scapularis muscle, which took place in some of the cases recorded.

The patient's arm was bandaged to his side, and a firm pad applied behind the head of the bone to prevent displacement.

Notwithstanding these precautions, in the course of the night, the bone again became displaced, so that it was necessary on the following day to etherize him, and replace it, which was done by one of my colleagues; my term of service having expired at the Hospital. The right arm was now confined behind the body for eight days, during which time the head of the bone remained in place. Being then brought back to its natural position, and bandaged firmly, in the course of the night it again became displaced. It was then replaced, and the arm confined, as before, behind the back; and he returned home on the 13th, promising to report in the course of a week.

He showed himself once or twice more at the Hospital. The arm retained its position in the socket, and the motions of the arm were improved.

CASE CCX. — *Dislocation of Shoulder of three months' standing. Reduction.* — May 17, 1861, a seaman entered the Hospital, with a dislocation of his shoulder of three months' duration, which had taken place as follows:—

While rounding the Cape of Good Hope, his ship encountered a heavy gale. A sea struck the vessel, while he was on deck, and knocked him violently against the taffrail. He received the blow on his arm just below the shoulder. The captain attempted to reduce the dislocation, but did not succeed; and, since then, the man had been using his arm as much as the limited motion would allow.

On the day following his entrance, May 18th, the patient was

etherized, the adhesions being first broken up, as far as could be, by rotation of the humerus; and, after extension and other manœuvres, continued for half an hour, the head of the bone was restored to its normal position under the acromion.

Owing either to the partial filling-up of the old socket, or what appeared to me a loss of substance in the front part of it, the head of the bone would not remain in place without support. A pad was therefore placed in the axilla, and a retentive bandage applied.

On the 1st of June, the bandage was removed, and slight motion of the arm advised. He gained slowly the muscular and nervous power, owing to the long time that the limb had been displaced; but was sufficiently well, June 22d, rather more than five weeks after the reduction, to leave the Hospital, having a pretty good use of his limb.

CASE CCXI. — *Dislocation of Shoulder, with Probable Fracture of Glenoid Cavity.* — June 18, 1861. About six weeks before, while this patient, a man of 35 years, was standing in his store, he was seized with giddiness, and fell, striking upon his left shoulder. For two weeks after the accident, he felt pain and a sense of uneasiness about the shoulder, which was examined by several physicians, who could detect nothing abnormal. At the end of the two weeks, as he was pulling on a rope attached to a limb of a tree, the limb sprang back; and the rope, catching in his arm, gave it a severe twitch, thereby dislocating it. Several attempts had been made to reduce it before his entrance into the Hospital.

On examination, there was the usual prominence of the acromion; and the head of the humerus was felt under the coracoid process. Having been etherized, the reduction was easily effected; though, with slight pressure, the bone would slip back to its former position.

In his first fall, the patient probably broke off the anterior edge of the glenoid cavity. This would explain the trouble he had after the first injury, the fragment acting as a foreign body. By means of a bandage, the head of the bone was kept in its place; and patient made a good recovery. It may be remarked,

that, in these cases of old dislocation of the shoulder, the fracture of the socket is supposed from the manner in which the accident occurred. Secondary displacements would take place, from obvious reasons, if this fracture was present. In a recent case of dislocation, the practised surgeon cannot mistake cartilaginous for bony crepitus.

CASE CCXII. — *Lateral Dislocation of the Elbow.* — This accident is excessively rare, and the only case of complete lateral dislocation that I can find is one described and figured by Nélaton.

Nov. 23, 1863. The patient was a tall, muscular man about 25 years old, and, in wrestling with another man of about his own strength, was thrown violently down, his arm coming under him. On rising, the arm was powerless, and he supposed that the joint had been fractured. He was brought to my house in a state of great suffering. Supposing that it was a case of a common dislocation of the elbow, I felt for the projection of the olecranon through the clothes, but could not distinguish it. Neither was crepitus produced by attempts at rotation. The clothes being removed, with some difficulty, as the man was in great pain, the condition of the limb could be observed. The fore-arm was very slightly flexed on the arm, but less so than in the dislocation backward, and was not so much fixed. The back part of the elbow was completely flattened, and none of the processes of the bones which enter into the joint were anywhere prominent. The breadth of the elbow was about one-third greater than natural. By manipulation, the articulating process of the radius, the olecranon and the internal condyle of the humerus could be distinguished in the mass; but the whole anatomical condition of the parts was of the most perplexing nature. By extension, flexion, and rotation, after two efforts, the articular surfaces were restored to their natural position. The case did well.

CASE CCXIII. — *Fracture of the Arm just above the Condyles, of seven weeks' standing, imitating Dislocation of the Fore-arm backwards.* — 1866. I have lately had an opportu-

nity of seeing a case of the above description in the practice of Dr. Cabot, one of my colleagues at the Hospital, and, with his permission, give it to show the deceptive appearances which may be produced after a fracture.

The patient, a child of six years, was thrown down by a boy, and sustained what the surgeon in attendance considered, and which undoubtedly was, a fracture of the humerus just above the condyles.

Seven weeks after, the inflammation and swelling having subsided, he entered the Hospital to have what, on a cursory examination, seemed to be a dislocation of the fore-arm backwards reduced.

A more careful inspection was made on the next day, with the following result: On the front of the arm, there was a slight ecchymosis; the fore-arm could be flexed to about a right angle; and, just in front of the joint, the lower end of the shaft of the humerus projected, not sharp or rough, as described in recent fracture, nor so broad as we ordinarily meet in dislocation. On the inner side of this portion of the humerus was a rounded process, which felt very much like the inner condyle. On the outside of the elbow, the head of the radius could be felt behind the humerus. By careful manipulation just above it, the outer condyle was found, upon which it moved freely. The olecranon could be easily distinguished, displaced backwards, and on its inner side a portion of bone was felt.

Flexion was good to only a limited degree, and there was no lateral motion, but the arm could be completely extended; the two latter points constituting the chief difference between fracture and dislocation of the elbow.

The diagnosis made was that of fracture of the humerus just above the condyles; the upper fragment being forced down in front of the elbow-joint, and the lower fragment carried up behind the shaft of the humerus, to which it had become attached. Under ether, after a moderate amount of force had been used, the motions of the arm were somewhat improved.

The appearances have been given in detail, from the fact, that the differential diagnosis between fracture and dislocation is generally made when the injury is recent, and before the process of

repair has been set up. After the bones have united, in a fracture near a joint, with some displacement, it is often very difficult, and sometimes impossible, to decide whether we have to deal with an unreduced dislocation, or a fracture with the bones united at an angle.

CASE CCXIV. — *Dislocation of both Thighs: one, into the Foramen Ovale; the other, on the Dorsum of the Ilium, with Fracture of the Cervix Femoris. Reduction.* — The patient was brought into the Massachusetts General Hospital, having been crushed by the giving-way of a wooden house which he was engaged in moving, being struck upon the back as he was making an attempt to escape. The right leg first attracted attention. The thigh was fixed, slightly flexed on the body, standing off from it; the toes pointing nearly forward, the limb apparently elongated. A deep hollow was felt in the region of the trochanter, which had itself disappeared. The man being etherized, and the pulleys adjusted, a gradually increased force was applied to extend the limb. A sheet was placed under the upper part of it; and an assistant, standing on the table, directed to lift the limb. A slight rotation was then made to disengage the head of the bone, and it went into its place without any perceptible noise or action of the muscles.

The right limb being replaced, it was now perceived that the left limb was distorted, and presented all the signs of a dislocation upon the dorsum ilii. It was firmly fixed, shortened, the toes inverted, and resting upon the upper part of the other foot. The trochanter was prominent, and drawn up from its place to within about three inches of the crest of the ilium. On making an effort to move the limb, an indistinct, but very decided, crepitus was perceived.

The pulleys being adjusted, and ether administered, the limb was slowly and with much difficulty drawn down; a slight rotatory motion being given to it, when the head was on a level with the socket. It went into its place with a loud crack, which was heard by all the assistants. The limb now appeared, at first, to have regained its natural condition. As the effect of the ether upon the muscular system subsided, the limb gradually con-

tracted, and the foot became slightly everted. An examination now being made, by rotating the limb, and placing the finger on the trochanter, it was perfectly evident to all present, that there was a fracture of the thigh-bone passing through the trochanter. The two limbs were therefore confined; the right one by a weight attached to it, and a cradle placed over it. To the left, Desault's splint, as used at the Hospital, was applied. In addition to the above injuries, two or three ribs on the left side were fractured.

The best explanation of the appearances offered by the left limb is this: The violent crushing force dislocated the femur, at the same time breaking the neck of the bone. The separation of the parts was not, however, sufficient to prevent them from being replaced; but the signs of complete fracture of the neck of the femur were at once produced, on the bone being returned to its socket.

The subsequent history of this case is not without interest. The patient, from the time of his admission, had complained of his chest, where his ribs were broken. One night, some weeks after entrance, great difficulty of breathing came on; and, upon examining the chest, it was discovered that a congestion of the posterior part of both lungs had taken place, such as has before been observed at the Hospital in patients who for a long period of time have been confined on the back without movement, after serious injuries to the lower limbs. From this affection he very gradually recovered.

At the end of two months, he left the Hospital well. The motion of the right limb was natural. The left leg was a little shortened. The motions of the hip-joint were limited; on examination, the trochanter was found irregular at the point of fracture. As it had been thought possible that the head of the femur might have been left on the dorsum of the ilium when the complete fracture of the limb took place, search was made for it; but it could not be found there.

CASE CCXV.—*Case of Dislocation on Dorsum Ilii, with Probable Fracture of the Socket. Reduction. Frequent Recurrence of the Dislocation.*—A man was brought into

the Hospital with a dislocation on the dorsum ilii, which was caused by a wagon passing over him, the limb being at a right angle with the body. Ether was given, the pulleys applied, and the dislocation reduced. On raising the limb slightly, to examine it, it at once slipped out of place, and was again reduced. This experiment was once or twice repeated, with the same result. Dr. S. D. Townsend, who saw the man, verified the fact. Slight, though not very marked, crepitus attended the movements of the joint. From fear of displacement, and with the idea of a fracture of the edge of the upper and back part of the cotyloid cavity, the limb of the patient was kept rigidly confined in Desault's apparatus, and his desire to return home resisted. The precautions taken in this case were afterward shown to be not without reason. About three weeks after the accident, during my absence from town, the patient got out of bed, and, while resting on the injured limb, attempted to turn around, thus giving a slight twist to the hip-joint. The bone immediately slipped from its socket. This accident afterward, in the course of the next week, recurred a number of times from simple motions made by the patient while in bed. It was then determined to put on a permanent splint, and allow it to remain for several months. This had the desired effect, and the patient was seen by me some months after leaving the Hospital: the joint was then slowly regaining its mobility.

During the treatment, the patient was very desirous to return to his home, but was persuaded not to. Had he done so, and had the dislocation been reproduced (as it was very likely to have been), it might easily have been urged that the dislocation had never been reduced.

CASE CCXVI. — *Dislocation of the Hip-joint, with other Injuries.* — December, 1851. A man, about 30 years old, was buried under a bank of earth; and, on being dug out, was brought, about four hours after the accident, to the Hospital.

On examination, it was found that he was laboring under a slight concussion of the brain; that the right hip was dislocated, the limb being inverted, and shortened two and a half inches. The left testicle had been torn out from the scrotum, and hung

suspended by the spermatic cord. It was covered with gravel, and the external tunic was so dry from exposure as to crackle like parchment. As the vessels still continued to pulsate, I determined to make efforts to preserve it. It was therefore temporarily enveloped in a compress, wet with warm water; after which the patient was placed under the full influence of chloric ether, with a view to the reduction of the dislocation. The force of the pulleys being applied, although a perfect state of relaxation from the effect of the anæsthetic agent seemed to exist, it required continued effort, for ten or fifteen minutes, before the the muscles concerned in the dislocation began to yield. The limb was gradually brought down; and, when the head of the bone came opposite the socket, upon a slight rotatory movement, it slipped in with a distinct report. On moving the limb after the reduction, an uncommonly loud cartilaginous crepitus could be heard; and this symptom, in a modified form, continued for five or six weeks after the accident, even when he was sufficiently recovered to walk about the ward.

Attention was next given to the testicle. The scrotum having strongly contracted, it was found to be a matter of some difficulty to return it, but it was finally effected by seizing the scrotum with the fingers, and then forcibly crowding in the testicle through the wound with the thumbs, confining it thus until two or three sutures were made in the integuments.

The patient, when last seen, two months after the accident, was recovering the use of the injured limb. The wound in the scrotum had healed well, and the testicle seemed to have suffered but little from the exposure it had been subjected to.

The application of the extending force, made from the ankle, was found more convenient than by the ordinary method from the lower part of the thigh. No subsequent inconvenience was experienced by the patient in the knee-joint. He had some pain and swelling in the ankle-joint for a number of days after the injury; but whether it resulted from the accident, which was a complicated one, or was in any way connected with the manner in which the extending force was applied, it was impossible to determine.

CASE CCXVII. — *Dislocation on the Dorsum Ilii, of twenty-three days' standing. Reduction.* — A man 36 years old, of strong muscular development, was attempting to raise another who was lying across a railroad track. On making the effort, he fell; the weight of the lifted man coming against his pelvis and left thigh. He was unable to rise, and was taken to a neighboring house, where his hip was examined. The injury was supposed to be a sprain. He remained in bed for twenty-three days; and, as the limb did not recover, he was advised to go to the Hospital. Doing so, he walked a mile and a quarter to the railroad station. He came by the train to Boston, and entered the Hospital, March 13, 1862. On making an examination, I at once perceived that the limb was not in its natural position; and that the symptoms of a dislocation upon the dorsum ilii existed. The limb was shortened about two inches; the trochanter being about that distance nearer to the crest of the ilium than that of the opposite side, and the toes inverted, but not lying across the instep of the other foot; there being this peculiarity, that the legs stood off from the thigh, forming an angle with it, and giving him a knock-kneed appearance. The whole limb was much more movable than I have generally observed in a case of dislocation. This may possibly have arisen from the efforts which he had made to produce motion, under the impression that it was only a sprain. On turning him on his face, the nates of the injured side appeared much broader and rounder than on the other side; and, where the hollow usually exists behind the trochanter, an elevation was perceived, which on examination appeared to be the head of the bone, which rotated when the necessary movements were given to the femur.

The patient was etherized to the point of total relaxation of the muscles, and pulleys were applied, and the limb drawn down to the same length as the other. An attempt was now made to turn the head of the bone into its socket; but although, at the efforts at rotation, a tearing sound was heard, as if strong adhesions were being broken up, yet the bone could not be forced into its socket. An effort was then made to reduce it by Dr. Reid's method. This also failed; the only effect being to carry

the head of the bone around the socket, and lodge it in the foramen ovale. From this position, it was easily brought back to its original situation on the dorsum. The pulleys were now re-adjusted, and the limb again brought slowly down, so as to bring the head opposite the acetabulum; and, the pulleys being relaxed, a sudden twist and lift was given to the bone, which went into its proper place with a jerk. The limb at first, after the reduction, had rather an unnatural appearance, being seemingly longer than the other, so that I thought that possibly it might have again slipped under the socket; but, on moving it, I found those free motions which can only be given by a bone in its natural position. The apparent length of the limb arose from a deviation of the pelvis, it having been three weeks in a strained position.

CASE CCXVIII. — *Dislocation of the Hip upon Dorsum Ilii.* — June 16, 1859. The patient, a stout man of 23 years, while standing on the track of a railroad, was struck from behind in the pelvic region by a freight-car, thrown down upon the track, and dragged some distance. On examination, the dislocation was evident; the right leg being shortened two and a half inches, drawn up and thrown over the left, the foot inverted, and the head of the femur easily distinguished on the dorsum ilii.

The dislocation was readily reduced by the "flexion method," and the patient made a rapid recovery.

CASE CCXIX. — *Perineal Dislocation of Hip-joint, with Eversion of Foot.* — A man, 35 years of age, while standing nearly erect, was knocked down by the caving-in of a bank of earth, and was seen by me two hours afterwards. He was thrown forward on his left knee, with the thigh much flexed on the pelvis. Did not know what the position of the foot was at the time of the accident.

The left thigh was found to be flexed on the pelvis, at an angle of about 70° , firmly fixed, and about two and a half inches shorter than the other. The foot was everted. Near

the tuber ischii was a projection. There was considerable swelling about the hip.

The patient being etherized, extension was made by pulleys, at first in the axis of the thigh, and the limb rotated, but without effect. Extension being again made, the knee was depressed, and the upper end of the bone lifted forwards to the socket. This manœuvre brought the upper end of the bone forward upon the pelvis above the socket, and straightened the thigh, the foot being everted and the limb shortened.

Strong extension was next made in the axis of the body, the thigh rotated inwards, and, after slipping by the socket many times, the head of the femur snapped into its place. After some ecchymosis and swelling, the case terminated favorably.

CASE CCXX. — *Dislocation on the Dorsum of the Ilium.*
Reduction. — An intoxicated man was brought into the Hospital, in the first week of June, 1859, having been caught under a train of cars backing into the station-house. The right femur lay across the opposite thigh, so that the internal part of the right knee touched the left patella; the leg was a little bent upon the thigh, and the foot, slightly inverted, rested on the instep of the other. The trochanter was felt a little above the acetabulum; and the head of the bone, a little above and behind it, was indistinctly felt under the muscles. The thigh was immovably fixed, so that it could be seized near the knee-joint, and the patient almost turned over by it, without producing any motion of the limb.

Having fully etherized the man, I first attempted to reduce the dislocation, by Reid's method; viz., by strongly flexing the thigh, and making the knee describe a segment of a circle over the abdomen, thus sweeping the head of the bone partially around the socket. The seat of the dislocation was altered, but the head of the bone was not reduced. The limb was now seized gently by the ankle, and easily drawn down, till, when opposite the socket, a noise was heard as if it might have been reduced, but not of that decided character to satisfy me that it was so. Every person about thought it had been returned to its place. On letting the limb go, it seemed to have the natural direction, but was evidently a little shortened.

The limb was then again seized ; and, being dragged down, I put my hand behind the trochanter, gave it a little lift, and it went at once, with an unmistakable report, into its place. Motion could now be given to the limb, in every possible direction, without throwing it from its situation.

CASE CCXXI. — *Perineal Dislocation of the Hip-joint. Reduction.* — 1851. A young man, about 20 years of age, was struck on the outside of the thigh, and thrown down, by a bundle of hay which fell on him from a loft. On his being taken up, it was discovered that the right hip-joint was dislocated ; and I was requested by his physician to see him.

I found the patient lying on his back, the thigh standing out laterally from the trunk, and forming a right angle with it. At the spot usually occupied by the trochanter, a deep hollow existed. The head of the bone could be felt on the ascending branch of the ischium, and might at first easily have been mistaken for the tuber ischii. The patient would not allow any examination to be made until he had been placed under the influence of ether.

After the patient was etherized, the pulleys were adjusted, and, on the first effort at traction, the head of the bone slipped around the socket, producing the appearance of a dislocation into the ischiatic notch. The force of the pulleys was then increased ; and the head of the bone was quickly brought over, and went into its place with a distinct report. On the removal of the extending power, the limb was found to have recovered its proper length and motions.

A few years before the above, I had the following case : A gentleman, 60 years of age, fell from the third story of his store, alighting on his knees among some bales of goods. The effect was to produce a displacement of the right thigh, attended by phenomena like those observed in the preceding instance. The patient was etherized, and the limb replaced by manual force, without the aid of pulleys, the system being depressed at the time by the accident.

CASE CCXXII. — *Appearance of a Dislocation of the Hip-joint, after nearly forty years.* — This case is one of uncommon interest. The subject of it was a gentleman, about 30 years of age, who, in the latter part of the year 1821, applied to Dr. J. C. Warren on account of an injury to his hip-joint, which, he stated, had been injured twelve weeks before in the following manner. He was riding a spirited horse, when the animal suddenly reared and fell backwards upon him, the weight of the horse being received on the left thigh; the patient having fallen on his back, as he said, a little inclined to the left side. On attempting to rise, he found himself crippled.

After a careful examination of the case, it was declared to be a dislocation, and the patient was not encouraged to hope much from an operation. He persisted, however, in having an attempt at reduction made; and, after a consultation with the other medical officers of the Massachusetts General Hospital, it was agreed that this should be done. The effort failed, after all the ordinary means had been resorted to. About a week afterwards, the patient applied to another surgeon, who gave an opinion similar to that given by Dr. Warren, and made another attempt at reduction, but without success. Finally, he was induced to apply to a professed bone-setter, who made a third attempt, with the same result. Immediately after the accident, he had, it seems, called in two practitioners in the neighborhood, who made attempts at reduction, and supposed they had succeeded in replacing the bone.

About a year subsequently, contrary to the advice of Dr. Warren, a suit for malpractice was brought, by the patient, against the two surgeons who were originally called to the case. After one or two trials, the suit was withdrawn, the jury having disagreed, principally on account of a conflict of surgical testimony.

In September, 1858, I received a letter from Dr. Greeley, of Ellsworth, Me., the physician of this patient, stating that he was at the point of death; that his friends were both willing and desirous to have the case investigated, and that he himself had always expressed the wish that this should be done. On the receipt, a short time after, of the telegraphic despatch an-

nouncing his death, Dr. H. K. Oliver, at my request, proceeded to Ellsworth; and, after taking note of the external appearances of the body, separated the pelvis and the upper third of the thighs, and, by permission of his family (it being impossible to make a satisfactory investigation on the spot), brought the portions thus removed to Boston. Here, he made a careful dissection of the soft parts, on the affected side; and subsequently, these tissues having been removed by maceration, made a thorough examination of the bony structures.

The following is his report of the examination of the body, the dissection, &c. : —

“The body, with muscular and adipose tissues well developed, was lying on the bed, the shoulders being slightly raised. The lower extremities were on a line with the body; the heels being together, and on the same level. The limbs were therefore, to the eye, of equal length. The right side of the pelvis appeared to be somewhat lower than the left. The right foot varied but slightly from the perpendicular; the left turned out at an angle of 25° or 30° . The left knee was raised, so that the thigh made with the plane of the bed an angle of about 15° . The right knee being raised to the level of the left, a difference of two inches in the length of the limbs was noticeable. It was difficult, on account of the great amount of adipose tissue, to compare the length of the limbs by measuring from the anterior superior spinous processes of the ilia. The movements of the left thigh were limited, and confined exclusively to flexion and extension; no motion whatever being perceived in attempts at abduction and adduction. Extension of the leg was impossible, even after division of the tendons of the flexor muscles of the thigh. There was consequently a permanent flexion of the thigh upon the body, and of the leg upon the thigh. On the upper and inner part of the thigh, a large, hard mass could be felt, not existing in the corresponding locality on the right side. This was subsequently found to be the new bony socket. The body being turned over, the flatness of the left hip, as compared with the right, was very marked. On examination, a hard, rounded body, subsequently found to be the trochanter major, was felt lying rather deep below the level of the trochanter of the right side.

“In the dissection of the left hip, all the muscles, large and small, belonging to this region, were found, but noticeably less full in substance, and of a less healthy color, than those of the right side. The

change of direction taken by them, brought about by the change of the point of insertion,—namely, the trochanter major and the upper part of the thigh-bone,—was of course apparent. The gluteus minimus, as it passed over what remained of the acetabulum to reach its point of insertion, was firmly bound down to the ligament which covered the cavity by strong fibrous tissue. The obturator externus appeared to be reduced to a few fibres, arising from the ramus of the ischium and pubes. The cartilaginous, and, apparently, part of the osseous, rim of the acetabulum was absorbed. Stretched over what remained of the cavity was what appeared to be a part of the old capsular ligament, still partially enclosing the neck of the displaced bone. Beneath this ligament, and filling up the acetabulum, was a dense mass of adipose and fibrous tissue. Encompassing the new socket was a tough fibrous layer, which, as it surrounded the neck of the bone, assumed all the density and strength of a true capsule, with perhaps even greater thickness. No line of division between the new and the old capsular ligament just referred to could be detected. Upon dividing the capsular ligament, a ligamentum teres was found, fixing the head firmly in the socket, and receiving the nutrient vessels through a notch in the same relative position, namely, in the anterior part of the cavity, as in the true acetabulum. The articular cartilage of the new socket was wanting in that smooth, shining appearance, characteristic of articulating surfaces generally. That of the head of the bone was much less uneven. Besides the round ligament, a few small fibrous bands were seen attaching the head of the bone to the socket anteriorly. Upon examination of the interior of the pelvis, the thyroid foramen was found to be nearly obliterated by the rounded base of the new socket; but it still retained its membrane stretched over the intruding bony cup.

“Since maceration of the soft tissues, the following points are to be remarked in the bony structures:—

“An adventitious socket for the head of the thigh-bone is formed below, and a little in advance of the acetabulum on the left side. This socket fills up the greater portion of the thyroid foramen, and is bounded as follows: Superiorly, by the body of the pubes and the acetabulum, the cavity of the latter being encroached upon by the adventitious socket to the extent of one-half of its area; posteriorly, by the body of the ischium, upon which the socket rests without leaving any part of the thyroid foramen visible; inferiorly, by the rami of the ischium and pubes, leaving no part of the foramen visible there; anteriorly, by an irregular, crescent-shaped portion of the foramen,

one and three-quarter inches in length, by an average breadth of one-quarter of an inch. The major part of the socket is of one piece; but there are four separate pieces of bone of different sizes, the largest of which measures two inches in length by an average of one inch in breadth. These loose portions being fitted in the places where they appear to belong, the socket has an average outside diameter of three inches, and a depth of two inches. The substance of its parietes is quite firm, but irregular and rough externally, and somewhat rough internally. The opening through which the nutrient vessels passed from the interior of the pelvis into the cavity of the joint is seen at the anterior portion of the fundus of the socket.

“Where the socket is united with the ischium and the rami of the ischium and pubes, bony matter has been deposited in limited amount, so that a furrow extends from the old acetabulum posteriorly, round to the lower portion of the crescent-shaped opening anteriorly: but, upon the superior aspect, where the weight of the body was to be supported, the interval between the socket and the adjoining portion of the pelvis is entirely filled up. Here, in fact, is seen a firm, strong buttress, thrown across from the body of the pubes and the pubic portion of the ilium downwards and outwards, spreading over the whole superior surface of the socket quite to its outer edge. On examining the interior of the old acetabulum, its cavity, anteriorly, is seen to be considerably encroached upon by the posterior border of the buttress just described; and, posteriorly, by a second buttress, much smaller than the one mentioned, thrown down upon the socket from the posterior portion of the acetabulum.

“The head of the left femur is much larger than its fellow of the opposite side, and its surface quite rough. Its greatest circumference is six inches. From the head of the bone, along the neck anteriorly and superiorly, is thrown a ridge of bone nearly reaching the trochanter major. This adds materially to the circumference of the neck, which is five and one-eighth inches; that of the neck of the opposite side being four inches.

“The most careful scrutiny fails to detect signs of previous fracture anywhere, either in the pelvis or in the femur.”

Remarks.—The most important point which Dr. Warren was called upon to decide in this case was whether a dislocation of the bone existed or not. His opinion was that a dislocation did exist. The defendant in the suit, however, obtained a disagreement of the jury by the testimony of a distinguished surgeon,

who expressed a decided opinion that there was not and never had been a dislocation, but that the original injury was a fracture of the pelvis. It will be seen that no signs of any fracture having occurred are to be found in the specimen, but that the injury was what Dr. Warren supposed it to be,—a simple dislocation.

The question was made very prominent in the trial, whether the species of dislocation of the hip which Dr. Warren supposed this to be, —namely, downwards and backwards, with the head of the bone lying on the ischium, near the lesser ischiatic notch, —ever existed; and the work of Sir Astley Cooper was brought forward in proof that such a dislocation, although mentioned by some authorities, could not take place. Dr. Warren, however, did not understand Sir Astley to assert that this dislocation *could not* take place. Moreover, he felt, that in any case the evidence of his own senses should rather be his guide; and, as he was also of the belief that there was no depression at any point about the acetabulum in which the head of the bone could not, exceptionally, be lodged, he persisted in his opinion that the dislocation backwards and downwards was within the bounds of possibility, and that the dislocation in question was of that description. In this belief, he had the countenance of the consulting surgeons of the Massachusetts General Hospital.

Sir Astley, at that period, did not acknowledge the existence of this species of displacement of the hip-joint; yet, in later editions of his work, published by Bransby Cooper, one or two cases are related as having afterwards occurred to him: and, in the edition of Sir Astley Cooper on Dislocations, published by the Massachusetts Medical Society, two cases of this injury are described, the specimens of which I had the opportunity of seeing abroad; one, through the politeness of Mr. Edward Stanley, the distinguished surgeon of St. Bartholomew's Hospital; and the other, by the kindness of M. Robert, in Paris. In the latter case, the dislocation was partial, with the head of the bone resting on the socket. The dislocation downwards and backwards is, however, at the present day, very fully acknowledged, and I have seen it in my own practice; while Mr. Erichsen, in the last edition of his valuable work, has placed it among his

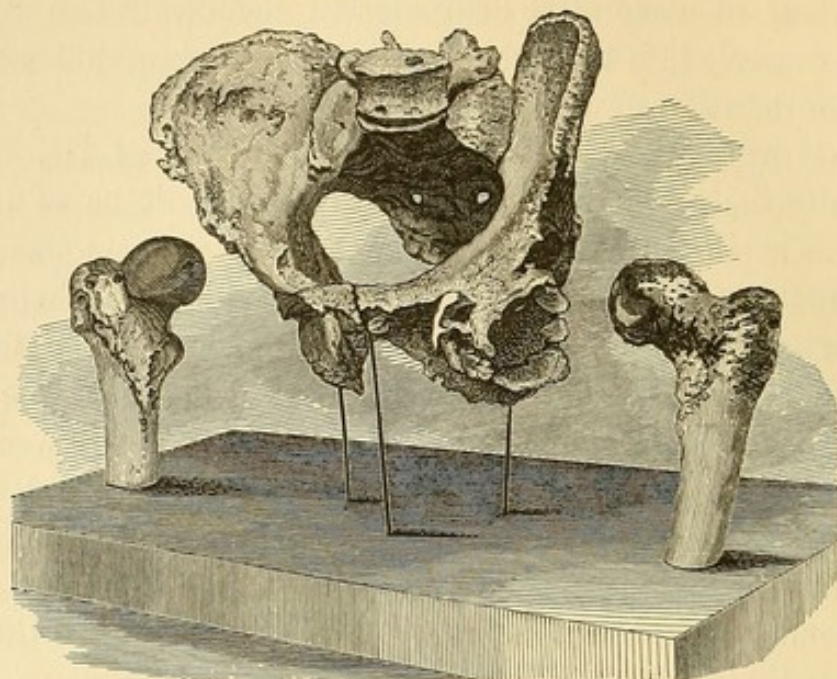
four forms of dislocation, considering the dislocation upwards and backwards into the ischiatic notch as simply a different form of the dislocation upwards on the ilium.

A few words as to the reasons which influenced Dr. Warren in his decision as to the kind of dislocation will be of interest here. The limb was lengthened; the displacement was therefore downwards. The next point was to determine whether this displacement was downwards and forwards into the foramen ovale, or downwards and backwards in the vicinity of the lesser ischiatic notch. The inclination of the foot and leg were such as to suggest to Dr. Warren the possibility of a displacement into the foramen ovale; but the phenomena were not so marked as to impress this species upon his mind to the exclusion of the displacement downwards and backwards, since he was of the opinion, that the position assumed by the limb might be varied by circumstances, being influenced by the degree and direction of the dislocating force, as well as by the subsequent condition of the capsular ligament.

In this condition of things, the head of the bone having been diligently sought for at the inner and upper part of the thigh, and not detected there, but a hard, round body being distinctly felt below and behind the acetabulum, the head of the bone was thought by Dr. Warren and his *confrères* at the Hospital, to be lying behind and upon the lower part of the body of the ischium, in the vicinity of the lesser ischiatic notch.

The dislocation as it now appears is not as it was described by Dr. Warren; but the socket for the head of the bone lies almost immediately under the old acetabulum, perhaps a little forward of it. The cause of the deception, it will be surmised, lies in the fact, that the head of the bone found its resting-place almost immediately under the acetabulum, at the posterior part of the thyroid foramen, and in contact with the body of the ischium. Such a position of the head would render its detection anteriorly quite difficult, even in very thin persons.

The specimen, beautifully prepared by Dr. Oliver, may be seen in the cabinet of the Warren Museum of Natural History. Its appearance is faithfully represented in the annexed engraving, copied from a photograph. Above the adventitious socket lies



what remains of the acetabulum. Anteriorly is seen the crescent-shaped portion of the thyroid foramen, and the notch described as admitting the nutrient vessels of the joint. The larger buttress, described by Dr. Oliver, is perceived above the new socket, and anterior to the acetabulum. The change in the appearance of the head of the thigh-bone of the affected side is very faithfully delineated.

The specimen, aside from the interest as connected with the trial, is exceedingly instructive in several respects. It is most curious to observe, that, in the deposition of the bony matter in the formation of the new socket, a distinct interval is left for the entrance of the nutrient vessels.

The firm, strong buttresses which nature has provided are found just at the points where they are needed in the support of the body. The depth of the new socket is quite remarkable, and will explain in a measure the impossibility of abducting or adducting the limb; the edges coming so far forward on, and encompassing so closely, the neck of the thigh-bone, as to make any such action impracticable.

CASE CCXXIII. — *Dislocation of the Thigh into the Foramen Ovale. Reduction.* — In the early part of May, 1859, I was called to see a man who had received an injury of the hip-

joint, also other injuries, by the fall of the wall of a house. When I arrived, he was lying on his back, with his left leg flexed on the pelvis, and standing off from the other at an angle of about 45° . A slight hollow was perceived at the seat of the trochanter, and the foot was slightly everted. Taking hold of the affected bone, I found it in a great degree fixed; and, the foot being everted, I at once recognized a dislocation into the foramen ovale without further examination, knowing that no other injury could present these symptoms, unless it were a fracture of the neck of the thigh-bone, in which case there would have been a certain degree of mobility of the injured limb. Farther examination also was impracticable, the patient having his clothes on, lying in the street, and making the greatest outcry on the slightest attempt to determine the nature of the injury. In addition to the above dislocation, he had a fracture of the lower end of the radius of the left arm, and a deep cut on the right temple.

He was placed on a litter, and conveyed to the Hospital, where I almost immediately followed. He was etherized, and the dislocated bone, with very slight manipulation, slipped into its place. The patient was kept in bed about three weeks by his other injuries, but, on getting upon his feet, recovered rapidly. The fractured radius, which was much displaced, was treated with the splint contrived by Dr. Bond, of Philadelphia, for that injury, which, for comfort and efficiency, is superior to any one that I know of for the treatment of this troublesome accident.

CASE CCXXIV. — *Dislocation into the Foramen Ovale of four weeks' standing, with other Injuries. Reduction.* — Oct. 9, 1861. A young man, 19 years of age, was brought into the Hospital, having, twenty-seven days before, fallen from the foreyard of a ship, while at sea; striking first on the roof of the cabin, and from thence slipping off, and striking the rail. By the first blow, the hip was dislocated; and, by the second, the right arm was broken in three places, viz., the head of the humerus, the olecranon, and the wrist. The bones of the arm had united when he entered the Hospital; the joints being rigid,

and the shaft of the humerus much in advance of the head of the bone. The patient was in rather a feeble state, and had gone through much suffering at sea; for four days after the injury there being a suppression of urine. The left thigh was out of its place, the knee was bent, the shaft of the femur projected forwards, forming an obtuse angle with the body. The toes presented almost directly forwards. The trochanter was not prominent, as on the opposite side; but there was no hollow. At the upper and inner part of the thigh, a prominence could be felt, not perceived on the other side; and this could be distinctly felt in the rectum, and was undoubtedly the head of the bone.

The patient being fully etherized, the thigh was seized, and efforts made to break up any adhesions which might have been formed, by making motions of flexion and rotation. By these manipulations, the head of the bone was dislodged from its position, and slipped up on the pubis, but would not enter the socket. On further efforts being made, it slipped round under the socket, and finally lodged on the dorsum ilii. In the course of the reduction, the appearances presented by all the different dislocations of the hip-joint were imitated. The pulleys were now applied; and the limb being gradually drawn down, when opposite the socket a movement of rotation was given it, and it slipped in. After the reduction, a rigidity of the muscles on the part of the thigh still gave it an unnatural look, as if it might be out of its place; but the restoration of an equal length to the other, and the free motions which could only take place with the head of the bone in the socket, dispelled any doubts.

The feet were then bound together, and the patient was put to bed. When seen, an hour after, the limb again projected forwards, as before the operation; and it was said that it had assumed that position after some struggles made by the patient in coming out from the effects of the ether. A little force, being applied to it, brought it down to a flat position in bed. While under the ether, flexion was given to the stiffened joints of the upper extremity.

The patient complained much of pain in the upper part of the

thigh, and required sixty drops of elixir of opium to make him sleep.

On the following day, there was a suppression of urine, as had occurred after the accident. He gradually but completely recovered the use of all his joints in about a month after the reduction.

CASE CCXXV. — *Dislocation of Thigh, with Fracture of the Acetabulum. Death. Autopsy.* — A strong, robust, though intemperate man, 36 years of age, fell from a roof, striking on his right side, and was carried to the Hospital. The following is the report: "On entrance, the patient lies on the injured side. When placed on his back, it was found that the right leg was shortened, the knee semi-flexed, and the foot inverted. The patient being etherized, the thigh could be flexed at a right angle with the abdomen. Crepitus could be heard about the head of the bone. By continued exertion, the limb was extended to within half an inch of the length of the sound limb, and Desault's splint applied."

The day following, the patient died of delirium tremens. At the autopsy, the following appearances were presented: There was a great effusion of blood into the tissues about the seat of injury. The head of the femur projected a short distance beyond the edge of the great sacro-ischiatic notch, having followed the groove left by the displacement of a fractured portion of the acetabulum and bone behind. The latter was about an inch and a half square, and three-quarters of an inch in thickness at the thickest point. The fracture also extended through the acetabulum and the bone. The head of the femur was deeply indented, and the fragments of the bone and cartilage were separated.

CASE CCXXVI. — *Dislocation of the Hip-joint backwards, and probably downwards. Reduction.* — A little boy, six years of age, was sitting on a long heavy piece of timber, on March 18, 1860, when it rolled, throwing him down, and passed over him, bruising different parts of his body. When taken into the house, he seemed so much injured otherwise, that his

mother did not pay particular attention to the injury of the hip. On the third day after the accident, Dr. S. A. Green, being called in, detected a dislocation of the left hip, and advised his removal to the Hospital.

When I first saw the boy, he was lying on the right side; the left thigh being drawn up nearly at a right angle with the body, and placed rather across the opposite limb, as in some cases of hip-disease. On lifting him, and making him stand on the sound limb, at the same time drawing down the displaced one as far as it would go, the foot pointed forwards, instead of resting on the top of the other foot, as in dislocation on the dorsum ilii; the pelvis was dragged down somewhat by the limb, and there was great tension of the muscles running from the femur to the pelvis, as is sometimes seen in dislocation into the foramen ovale, which it somewhat resembled in this respect; but one of the principal signs of that dislocation, the depression of the trochanter, was wanting. The dislocation, in fact, resembled more what has usually been called the dislocation downwards and backwards, in which the head of the bone lies a little behind and below the socket. I took pains to try to obtain some measurements as to the difference in length of the two limbs; but found this impracticable, in consequence of the bent position of the thigh on the pelvis. The head of the bone could not be felt, on account of the swelling which had taken place from the length of time since the displacement.

The child being etherized, I first attempted to reduce the limb by the method of sweeping the thigh over the opposite limb and pelvis, producing a rotation of the bone. The limb was then seized by the ankle, gradually dragged down into a straight position, and then, by a slight rotation outwards, the head of the bone slipped, with a very distinct sound, into its socket. Motion could now be made of it easily and freely in every direction.

CASE CCXXVII. — *Fracture of Upper Part of Thigh-bone, imitating Dislocation of the Hip-joint.* — A powerful man, aged 40, a seaman, entered the Hospital, June 14, 1865, for an injury of the hip-joint, received seventeen months be-

fore, which he supposed to be a dislocation. "He was guarding a government warehouse at Alexandria, Va., when he discovered three guerillas in the third story. He discharged his musket at one of them, killing him instantly; the second took to his heels; a struggle then ensued between the patient and the third one, which ended in their grappling each other, and both rolling down a hatchway, landing on the ground-floor, a distance of some thirty-five feet, the guerilla underneath. The latter received two fractured legs, and a sentence of fifteen years in the Albany Penitentiary." The seaman was carried to a hospital, and etherized. He was afterwards informed, that his thigh was dislocated, but had been reduced; and, at the end of six months, was discharged. His leg, however, never assumed its original length, and he had the impression that the dislocation was never reduced.

Upon examination, there was found shortening of one inch, but neither inversion nor eversion. He could walk; though, owing to the shortening and stiffness of the hip-joint, he carried a cane. There was an irregular projection (bony) behind the trochanter major. Patient was stout, robust, and in excellent health. Upon investigation, it was decided that the head of the thigh-bone was in its socket; and that the shortening was due to a fracture received at the time of the fall, the precise nature of which could not be ascertained. He was again examined June 21st, under the influence of ether, in the presence of all the visiting surgeons of the Hospital. It was decided that the head of the femur was in its proper position, and the shortening was the result of the old fracture.

The stiffness of the limb, the projection behind the socket, and the want of history in regard to the fracture, at first led to the supposition that the patient's impression as to a dislocation existing might be a true one. Under ether, however, the motion of every kind which could only be given to the head of a bone in its socket showed that the appearances were caused by fracture, whatever the original injury had been, which possibly might, from the nature of the accident, have been both fracture and dislocation.

The following is a summary of the dislocations of the hip treated in the Massachusetts General Hospital, from December, 1821, to May, 1866 : —

Dislocation.	Reduced.	Not Reduced.	Total.
Dorsum Ilii	22	3	25
Ischiatic Notch	8	2	10
Foramen Ovale	3	1	4
	<hr/> 33	<hr/> 6	<hr/> 39

Of these, 38 occurred in males, and 1 in a female. In 19, the pulleys were used ; in 20, no pulleys. Two of the unsuccessful cases were complicated with fracture.

AMPUTATIONS.

The question of points of election for the performance of amputation has been re-opened within the past few years, and the rule of practice materially changed from that even now taught in some of the approved European text-books. The old rule of amputating the leg within a few inches of the knee — for an injury, perhaps, of the ankle — has given place, in this country at least, to the much safer, and in every respect better, practice of saving as much of the limb as possible. This reform is due almost wholly to the invention of the improved conical socket, now so universally employed in modern artificial limbs, in which the weight of the body is sustained by the accurate adjustment of the tapering sides of the stump to the corresponding cavity made to receive it, while the sensitive cicatrix is effectually relieved from pressure.

The advantages of immediate amputation are perhaps now more fully recognized than ever before. Even during the period of depression or shock, where it would formerly have been thought necessary to wait for re-action, we now feel justified, in most cases, in proceeding at once to the operation ; having learned by experience, that the inhalation of ether is generally attended by a greater and more rapid restoration of the vital forces than that which follows the exhibition of alcoholic stimulants. By operating at this time, many patients may be saved, who would otherwise die from the gradual loss of blood, and from the nervous irritation dependent upon extensive injury.

The kinds of operation which have generally been preferred in this vicinity are the circular for limbs with a single bone, and the flap for the fore-arm and leg. The operations of Syme and Pirogoff, for saving as much as possible of the lower extremity, and as substitutes for amputation in the leg, are well worthy of adoption in suitable cases.

The operation by flaps of skin alone is now looked upon with great favor. I have often performed it with much satisfaction.

One amputation — that at the hip-joint — may be particularly mentioned, on account of its striking want of success. Out of twenty-three operations mentioned by Macleod as having been performed in the Crimea, all proved fatal; and, during the late war in this country, the successful cases were very few. It has been thought safer, therefore, to leave a man, with a compound comminuted fracture high up in the thigh, to the chances afforded by nature, rather than to perform the amputation now under consideration.

I have had an opportunity of twice performing this amputation in Boston. One case was in a child whose limb was partially torn off by a railroad accident; the other was for a large tumor of the femur, which reached high up into the groin. The first patient died at the end of a fortnight, without evident cause, when apparently in a fair way of recovery; the other recovered. The method adopted in the last case was by making anterior and posterior flaps of integument; tying the femoral artery before making the section of the muscles.

In cases of re-amputation for diseased stumps of the leg, and for tumors high up on the leg, where it is desirable not to go above the knee, I have had the following experience: —

The flaps of skin being made, and the tibia and fibula sawn through just below their heads, the popliteal artery is apt to be cut off at its division into the anterior and posterior tibial arteries. At the same time, the stump almost immediately is retracted by the muscles into the popliteal space; and a troublesome hemorrhage commences, which it is difficult to arrest with the patient in his ordinary position on the back, and embarrassment is experienced in finding the vessels. Much blood also is usually lost, if the surgeon has trusted the vessel to digital com-

pression. During the spring of 1866, having had a number of these cases to deal with, I found great convenience in turning the patient at once over on his face, in which position the vessels were easily secured. In these cases, the simple flaps of skin have healed much more favorably than by the old method of muscular flaps, as recommended by Liston. For amputation of the thigh, Dr. John Green, formerly of Boston, now of St. Louis, in the June number of the Boston "Medical and Surgical Journal" for 1863, has given an excellent *résumé* of the best methods now in use for making a good stump, which have been sustained by his experience in the army during the late war.

On account of the danger of pyæmia in amputations at the present day, it has been proposed to operate at the joint, as less likely to be followed by this occurrence, than where the bone is divided in its continuity.

Lisfranc's, Chopart's, Pirogoff's, and Syme's operations, I have had occasion to perform. In civil practice, however, the nature of the injury for which amputation is performed is such, that the opportunity for these operations is comparatively rare. They are peculiarly applicable to the lesions produced by fire-arms.

CASE CCXXVIII. — *Amputation of the Arm above the Elbow for Congenital Cancer of the Fore-arm. Death, after two years, from Internal Cancer.* — A child, 11 months old, was brought to my surgical infirmary by its parents, on Sept. 9, 1843, having a large tumor involving the whole of the left fore-arm. At birth, the tumor was about the size of an egg, and regularly increased with the growth of the child.

The mother was delicate, but none of the family had been affected with cancer. The child was, in other respects, apparently in fine health. The tumor evidently was carcinomatous. It was of a firm consistence, somewhat irregular in its outline, and in one part slightly discolored. Immediate amputation was advised.

The parents did not bring the child again until the 7th of October, nearly a month afterwards. The tumor was then larger, and had softened at the discolored portion. Amputation was performed above the elbow.

The operation was borne well, and in a few weeks the child recovered perfectly. The tumor, being cut open, was found to be encephaloid cancer, softening having commenced in it. I did not hear from this child again until the month of June, 1845, when I was called to attend the autopsy; he having died under the following circumstances. He had been in full health until three months before, when a physician was called to see him, and found him laboring under a slight cough, and distress in the right side of the chest, which was slightly enlarged. The cough and pain gradually increased; the chest and abdomen becoming enormously distended, as if from an internal tumor. He finally died in great suffering.

The cavity of the thorax was occupied by an enormous mass of encephaloid disease, which had taken the place of the lung, some traces of which were found in the back part of the chest. The diseased mass forced the heart over to the left side; it also projected through the crura of the diaphragm into the abdomen. The substance of the left lung was studded with encephaloid masses, some of which hung, as it were, dependent from its surface. The heart was healthy. The liver, although not decidedly cancerous, was evidently much changed in structure. The kidneys, spleen, and other organs, were normal. The stump of the arm amputated was in a healthy condition, as well as the axilla of that side. The extremities of the nerves were much enlarged.

CASE CCXXIX. — *Amputation at the Shoulder-joint, for Suppuration after a Burn.* — A boy, four years of age, was brought into the Hospital in the middle of February, 1860, with his entire arm, part of his face, and chest, burned by the explosion of a burning-fluid lamp. The burn of the face and chest did well; but almost the whole surface of the arm suppurated, and for a long time it was supposed the child must succumb, so profuse was the discharge. He was only kept alive by the use of large quantities of stimulants, taking from six to eight ounces of brandy in twenty-four hours. Finally, about the third week in March, the arm began to have a gangrenous appearance, with patches in different parts, attended by hemorrhage from one of

them, which was arrested by the perchloride of iron. He had also, at this time, hemorrhage from his nose.

As soon as the child had rallied sufficiently, it was proposed to remove the arm, the stench from which was hardly supportable in the room. The parents, who were of the most ignorant and degraded sort, at first declined to have any thing done, but finally consented. The daily dressing of the wound caused the most violent outcries from the patient, on account of the excessive pain.

The burn extended quite up to the shoulder; and, with the exception of a small flap of skin behind, there was no integument left to cover the wound. In removing the limb at the joint, the head of the bone was found to be so incorporated with the capsule, and attached to it, as well as so softened by disease, that the knife at first cut deeply into it. The vessels were immediately seized, compressed, and tied, so that very little blood was lost. A couple of sutures brought together the irregular edges of the wound.

The irritation caused by the limb being removed, the patient's pulse rose at once. He almost immediately began to take food, recovered his appetite, and very soon his health.

Some time afterwards, he was seized with attacks of unconsciousness, lasting at first for a short time, and ultimately died with cerebral symptoms.

CASE CCXXX. — *Amputation at the Shoulder-joint for Injury.* — An Irishman, 32 years of age, was brought to the Hospital on May 16, 1851; his arm having been drawn in, two hours before, between the cog-wheels of powerful machinery used for pressing hemp. The limb passed in up to the shoulder. The bones of the hand were found to be crushed, the radius and ulna not broken, the lower two-thirds of the humerus comminuted; and an opening over the brachial artery, two inches below the axilla, allowed the finger to be passed in and up to the joint. The limb was removed by an anterior and posterior flap. Some difficulty was experienced in disarticulating the head of the humerus, from the fact, that, the bone being broken below, no purchase could be had by which the head

could be lifted from its socket. A powerful pair of forceps had been provided for this purpose; but the displacement was effected without having recourse to them. The patient did well.

This was the first case of amputation at the shoulder-joint occurring at the Hospital.

It will not be out of place to mention here a contrivance which I had subsequently arranged to replace in a degree the amputated arm. Finding how free and powerful the actions of the muscles were upon the scapula, I had a large solid leather cot or covering made to fit the stump. This was kept in place by two straps; one passing over the opposite shoulder, the other and stronger one round under the opposite axilla. A strong hook was inserted in the end of the stump. With this appendage, the man assured me, that, after some months' practice, he was able to do as good a day's work in sawing wood as he formerly could with the lost arm.

CASE CCXXXI. — *Malignant Tumor of the Right Arm, requiring Amputation at the Shoulder-joint.* — This patient was a tall, thin man, 30 years of age. He had always been healthy until April, 1850, when he had discharges of blood from the kidneys, unattended with pain, continuing for one or two weeks. In June, the tumor appeared as a small hard lump under the skin of the arm, near the insertion of the deltoid muscle. This gradually increased until it nearly encircled the arm, extending under, and raising up, the brachial artery and nerves. The motions of the limb were not much affected by its pressure until the winter of 1850-51, when it increased rapidly, and the active portion became somewhat painful. His physician considered the case a critical one, demanding the removal of the tumor or of the arm, and directed him to me. After a careful examination of the tumor, which was quite firm and movable, it was agreed that the patient should be etherized, the tumor cut into, and, if found to possess the characters of a malignant growth, that the arm should be removed at the shoulder-joint.

The operation was done on the 15th of February, 1851; and, when the tumor was incised, it was found to be carcinomatous.

The bleeding from it, which was quite free, was therefore stanchd with a bit of sponge, and the removal of the arm proceeded with. This was done by an anterior and a posterior flap; the former being made from without inwards by means of a scalpel, in order to have a more regular wound, and the better to avoid impinging on the tumor. The subclavian artery, as it passes over the first rib, was so effectually compressed by Dr. H. W. Williams that scarcely any blood was lost.

On Feb. 20th, he had a discharge of bloody urine, after a severe pain in the loins. He seemed to attach but little importance to it; and, in fact, it soon ceased. He rapidly recovered.

The tumor had a lardaceous appearance, and, under the microscope, showed fibrous tissue, in which, after much investigation, cancer-cells were distinguished.

CASE CCXXXII.—*Necrosis of Humerus. Amputation.*
—The patient was 21 years old. Three years before, after getting wet, he was seized with an inflammation in the vicinity of the elbow-joint, and suppuration ensued. After a time, bone was discharged. Other parts of the arm were subsequently attacked, and much bone removed. In the course of the disease, the shoulder-joint and the elbow-joint became ankylosed; leaving the hand fixed in strong rotation over the pubes, only a slight lateral action being permitted by the movement of the scapula on the body. Very large sequestra still remained; and, from the position of the hand and loss of use of the joints, it was thought, that, even if all the dead bone was removed, the limb would be left useless. Amputation was therefore decided on. Some difficulty was experienced in fixing on the point for removal. If the section was made above the apertures in the head of the humerus, it would be difficult to get a flap from the inside on account of the size of the new bone, which was forced close upon the ribs, obliterating, as it were, the axilla. On consultation, it was decided to amputate a few inches below the shoulder, removing the sequestrum afterwards. This was done, and a large piece of dead bone forcibly extracted. The axillary artery, from the confined position of the wound, was secured with some difficulty, as had been apprehended.

The patient left the Hospital about four weeks after the operation, much improved in health, with the wound in a healthy condition.

CASE CCXXXIII. — *Syme's Operation on a Girl affected with Talipes Varus and Spina Bifida.* — A girl, 13 years old, entered the Hospital, April 13, 1860, on account of congenital talipes varus of the left foot, with ulceration below the ankle, which had existed for six years.

She had also a spina bifida over the sacrum, about four inches in diameter. It was fluctuating, elastic, and painful under strong pressure. She had incontinence of urine, and, at times, of feces. Her mental faculties were impaired. There was a fetid discharge from the ulcer, and dead bone could be felt with a probe.

April 21st. Syme's operation was performed at the ankle-joint. There was more than usual suppuration in the wound; and, May 4th, free hemorrhage occurred, which was stopped with difficulty. Subsequently, she did well, and was discharged May 26th.

The disease in this case appears to have arisen from impaired nervous energy, probably owing to the tumor implicating the spinal cord.

CASE CCXXXIV. — *Amputation for Caries of the Bones of the Foot. Double Talipes Varus. Spina Bifida.* — A young lady, 17 years of age, applied to me for advice in April, 1849. She had a spina bifida over the last lumbar vertebra, which in infancy was about the size of a bean. At the time I saw her, it was divided by a deep sulcus, one side directly over the spine; being about as large as a medium-sized apple, soft and fluctuating, and protected by a thick, tough skin. The other side, about half as large as the first, bulged out on the right, and was solid. This tumor gave rise to no abnormal sensations; nor did it interfere with the motion of the lower extremities, unless when injured by a blow, when it was followed by temporary numbness.

Soon after she began to walk, talipes varus of the left foot

appeared; and so great was the deformity, that she rested entirely upon the outside of the foot. The friction and pressure gave rise to an ulcer, which resisted treatment, and gradually extended over the whole of the side of the foot. From time to time, portions of bone had been discharged, and finally the little toe separated in a gangrenous condition. Necrosed bone could still be detected through three fistulous openings in the ulcer. After a long attack of sickness in her eighth year, the right foot became deformed in a similar manner to the left.

The left leg was one and a half inches shorter than the right, the knee two and a half inches larger round. The shortening was caused by the loss of portions of the fibula and tibia, which were discharged through fistulæ whose cicatrices remained. There was an abscess over the external malleolus on the outside of the right foot.

April 7th. She was etherized, and the left foot amputated, just above the ankle, by the lateral-flap method. The edges of the wound were brought together by a single suture and adhesive plaster. She did well; the wound uniting partly by first intention, and partly by granulation.

May 4th. The tendon of the tibialis anticus and the tendo Achillis of the right leg were divided; and, a few days subsequently, an apparatus was applied to straighten the foot.

June 30th. She could rest her weight upon the sole of her right foot, though it was not entirely straightened, and was still weak. She afterwards had an artificial foot for the left leg, which restored completely the power of walking.

CASE CCXXXV.—*Pirogoff's Amputation at Ankle-joint for Railroad Accident. Sloughing. Re-amputation. Recovery.*—A young man, about 20 years old, was brought into the Hospital on the 23d of June, 1865, with his foot crushed; having, the night before, stepped upon the top of an engine while in motion, catching his foot in the machinery. The phalanges and metatarsal bones were comminuted, the integument covering them destroyed, and the skin torn upwards over the astragalus. He insisted that nothing should be removed that was not absolutely crushed, though I informed him of the dan-

ger of sloughing of the soft parts in accidents of this description in which vitality did not appear destroyed at the time. It was decided, therefore, to perform Pirogoff's operation.

An incision was made in front of the internal malleolus, carried under the foot, and terminated near the external malleolus. The integuments of the heel were then dissected a little from the bones, and the incision carried across the foot in front, so as to expose the joint. The astragalus was disarticulated; and, in dissecting it out, in order to get at the os calcis, care was taken not to injure the posterior tibial artery. The os calcis was then sawn through obliquely, and the foot removed. The integuments of the lower part of the leg covering the joint were dissected back a little; and the external and internal malleoli, together with the articular surface of the tibia, were removed with a saw. This was done with some difficulty, owing to the primary incisions having been made in front of the malleoli, as described in the books; whereas it would have been much better to have begun farther back, which could have been easily done without endangering the vessels that supply the flap. It being found that the os calcis interfered somewhat with the easy approximation of the lips of the wound, a slice was removed from it. The ends of two or three tendons which projected were cut off with scissors, as was also about an inch of the plantar nerve. The bone came well into place, and the edges of the wound were approximated by a large number of sutures. A broad strip of adhesive plaster was applied so as to keep the bone steady, over this a towel folded lengthwise, and the whole secured in a hollow padded splint to counteract any retraction of the muscles of the calf. He was ordered a large opiate at night, and slept quite well. The next day he complained of pain from the pressure of the splint, which was then removed.

On the 25th of June, the weather being very hot and the smell of the dressings quite offensive, they were removed, with the exception of the adhesive plaster; and a compress, wet with a weak solution of the permanganate of potash, was applied. Very shortly, as I had feared, a slough commenced in the centre of the wound; and, as it separated, repeated hemorrhages took

place, finally followed by gangrene and erysipelas of the lower part of the stump. It being impossible to amputate the limb in that condition, the flaps were separated, and the bleeding vessels found and tied. The limb subsequently required amputation higher up, which was done some weeks afterwards, by one of my colleagues (my service having expired), when the patient was in a proper condition to support it; and he did well.

The operation of Pirogoff at first gave every indication of success; but, as we are continually observing in railroad accidents, the injury to the muscles, vessels, and nerves, was much more extensive than would at first be supposed, and necessitated the subsequent amputation of the leg.

CASE CCXXXVI. — *Re-amputation of Leg. Recovery.*
— March 22, 1866, a man 48 years old entered the Hospital for painful stump of right leg: twenty-eight years before, when at sea, whaling, his right foot was torn off at the ankle, by being caught in a coil of rope which was "running out" with great rapidity. A few days after the injury, the leg was amputated just above the ankle. The patient stated that no flaps were made, but that the limb was cut "square off." The stump was long in healing, and afterwards there was much pain of a neuralgic character in it. For the three months previous to his coming to the Hospital, he suffered from an indolent ulcer on the end of the stump.

March 24th. The patient being etherized, re-amputation was performed, by flaps; a long anterior and short posterior one, chiefly of skin, being taken. There was much venous oozing after the vessels were tied, which, however, subsided after the stump had been exposed to the air for two hours. The flaps were then brought together with seven sutures, and cold water-dressings applied with a moderately firm bandage. On examination of the amputated portion, the posterior tibial nerve was found to be bulbous at its extremity; and from it numerous nervous filaments were distributed to the end of the bone. The flaps united almost by first intention, and in three weeks the patient was discharged well.

CASE CCXXXVII. — *Amputation of Leg, high up, with Cutaneous Flaps.* — April 6, 1866, a man aged 46 entered the Hospital with a large ulcer of a cancerous appearance entirely encircling the lower part of the right leg. Its edges were callous and elevated. It began three years before, and he had done no work since. The last six months, he had been unable to walk on the leg, which was bent to a right angle with the thigh.

Amputation being decided upon, the question was, at what point this should be done. There was integument enough for a long stump; but this was objectionable on account of the flexed position of the knee. It was therefore determined to divide the bones just below the head of the tibia, as making a better stump than the condyles of the femur by the knee-joint operation.

The popliteal artery, being divided just after its bifurcation, retracted, and the stump, at the same time, was powerfully drawn backwards by the flexor muscles still attached to it. This state of things rendered it very difficult to get at the vessels; but, by turning the patient on his face and dissecting up the tissues, they were finally reached and tied.

In the present instance, two flaps were made of skin alone, instead of employing Liston's method, the division of the muscles being made by a circular cut. The two arteries, lying in contact just after the division, were now easily seen, and tied at the back of the wound.

This amputation, with two flaps of skin and a circular cut in the muscles, is the most satisfactory one, in this situation, that I have ever done. An amputation, lower down, performed recently in the same way, has also resulted better than usual.

The ulcer, on microscopic examination, proved to be epithelial cancer. The bones, though perhaps a little enlarged, were not implicated in the disease. The patient did remarkably well, the flaps healing almost by the first intention.

CASE CCXXXVIII. — *Amputation of the Thigh at the Lower Third, for Disease of the Knee-joint of eighteen years' standing.* — The following case of disease of the knee-

joint is one of those so frequently met with, more particularly in women, where the patient is kept under treatment for many years, with alternate improvement and relapses; the disease ultimately requiring an operation. On inspection of the joint, the surgeon is surprised at the great extent of disease, and that the operation has been so long deferred.

A woman, 42 years of age, much emaciated, and of a very livid complexion, came under my care in the Hospital, in April, 1865. Eighteen years before, she had fallen down stairs, striking upon the right knee, which became swollen, and confined her to her bed for five or six weeks. Since then, she had scarcely ever passed a year without having an attack of inflammation in the joint, confining her to the house. In April, 1864, it became more inflamed than usual; and an abscess formed, which pointed in the popliteal space.

The limb was somewhat flexed, and the tibia slightly dislocated backwards upon the femur, and the patella apparently fixed to the outer condyle. The husband of the patient wished her, as she said, to submit to treatment for several months more before having any operation performed; but she preferred to wait no longer. The question of excision was considered, but not urged, on account of the state of her general health; and she decided the matter by declaring for an amputation. This was done by the circular method, with the loss of but a few drops of blood; compression being made by a tourniquet invented by John Whitton, the ingenious ward-tender at the Hospital, which compressed the artery only, without interfering with the venous circulation. The wound was closed with two sutures; and the only dressing used was a compress, wet with a weak solution of permanganate of potash, with the view of preventing infection of the wound by Hospital gangrene, which was prevalent at the time. The shock of the operation produced considerable exhaustion; but, by the use of stimulants for several hours, she recovered from her depressed condition.

The case terminated favorably in a few weeks.

An examination of the joint showed the tibia displaced backwards upon the condyles of the femur, the cartilages completely destroyed, and the epiphyses of the bones extensively carious,

and in a crumbling condition. The cavity of the joint opened externally by an irregular fistulous canal, which terminated in the popliteal space; and the patella was firmly fixed to the outer condyle of the femur.

CASE CCXXXIX. — *Compound Fracture into the Knee-joint. Great Depression. Amputation of Thigh.* — 1852. This man was first seen by me at 6, P.M., having received a compound comminuted fracture of the knee-joint an hour and a half before, from the fluke of an anchor falling upon him. A wound existed on each side of the joint, so that the finger could be passed from one side to the other, encountering the broken fragments of bone. The injured part was quite insensible to the examination. There was a moderate but constant flow of blood from the wounds. The pulse was 120, irregular, feeble; patient a little flighty. Stimulants were given every fifteen minutes for two hours, but with no improvement in the pulse; the discharge of blood gradually increasing from the wounds. Under these circumstances, the question which presented itself was, whether to proceed to immediate amputation, from fear of the patient losing his chance by hemorrhage, or to apply a tourniquet, and wait for an improvement in the symptoms.

On consultation with my colleagues at the Hospital, the latter course was decided upon. On the following morning, the appearances were much the same; pulse 120. The leaking of venous blood continued. On further consultation, it was thought unsafe to defer longer the removal of the injured part. He was therefore etherized, and the amputation performed. The case terminated favorably. Generally speaking, cases of this description have done well after immediate amputation, since the introduction of ether. The want of vitality in the present case, however, seemed hardly to justify it, even with the assistance of this agent.

CASE CCXL. — *Amputation of Thigh for Necrosis.* — Mr. F., 28 years of age, applied to me in February, 1864, on account of a necrosis of the femur, for which he requested to have an amputation performed. When he was fifteen years old,

he received a shock in the limb by jumping from a wall, which was followed by severe inflammation, ending in abscess, which opened at the lower and inner part of the thigh, just above the knee. In the course of a year, abscesses formed along the whole length of the limb, communicating with the bone, some in front, and some on the outer side, as high as the trochanter major; through these apertures, small pieces of bone were occasionally discharged. In the first year, while bearing some weight on the leg, the femur gave way in its lower third, but united again, with shortening of three or four inches, and with a decided bend outwards. From 1856 to 1864, he suffered much at the original site of the disease; the inflammation extending to the knee-joint, which became nearly stiff. For nearly half of this period of thirteen years, he was confined by successive attacks of inflammation; and he finally decided to submit to an operation, when he saw that his future usefulness and comfort were likely to be altogether destroyed. A consultation was held upon the case at the Hospital, which resulted in the decision to remove the limb at the level of the highest fistulous opening, which was at the commencement of the upper third of the femur; and, in case the sequestrum should be found to extend higher, to attempt its forcible extraction by means of forceps, which I had before successfully accomplished in a similar case, where it was important to preserve as long a stump as possible. The exact amount of bone diseased could not be accurately determined, owing to the severe pain and protracted constitutional disturbance which had several times followed the attempt to probe the lower openings in the popliteal region, and which was explained on dissection by the proximity of the sequestrum to the great ischiatic nerve.

The operation was performed Feb. 27th. A flap was first cut out on the front and outer side of the thigh, having its base at the upper aperture already described, which was placed rather on its inner aspect. An inner and posterior flap was then made, and the bone sawed off just above the point of junction of the flaps, which proved to be in the sound bone, three-quarters of an inch above the upper extremity of the sequestrum. This was about four inches long, and lay loosely encased in a cavity

in the back and lower portion of the femur, which was open for the most part, but was crossed, at about the middle of its length, by a bridge of new bone of about half an inch in breadth. The nerve, as above stated, lay directly on it. The sequestrum was so loose that it could have been entirely removed, if it had been possible to reach it by any justifiable operation. The knee-joint had been partially disorganized by inflammation; two small surfaces, however, remaining on the condyles, still covered by cartilage, each about half an inch in diameter, and corresponding to the articulating surfaces of the tibia, which were concerned in the slight motion remaining. On the curved portion of the bone, in front and opposite to the sequestrum, were marks of the very oblique fracture which had taken place during the first year of the disease. The specimen is now in the Warren Anatomical Museum.

In speaking of this case, I would remark, that I have seen very few cases of extensive necrosis of the femur which have been relieved by operation. The records of the Massachusetts General Hospital show the same fact. In one case, I removed half of the shaft, near its lower extremity, with perfect relief; in another case, of twenty years' duration, which was one of necrosis of the whole length of the shaft of the bone, the operation was followed by so long and exhausting a suppuration as to compel the amputation of the limb just below the trochanters, to save the patient's life. This man afterwards died of an extensive cancer of the stump. In the present instance, even if the removal of the dead bone had been practicable, the patient would have been left with a deformed limb, three or four inches shorter than its fellow, and with little or no useful motion of the knee-joint.

In this case, as is usual where there has been much previous inflammation in the amputated limb, the hemorrhage from the smaller vessels was very abundant.

The convalescence was slow, and interrupted by a series of abscesses in the stump. Although no exfoliation of bone took place, it was several months before the patient was well enough to return to his home in the country, but with his stump only partially healed. In October, 1864, I saw him in fine health

and high spirits, his stump entirely healed, and having gained thirty or forty pounds of flesh. This increase in weight, as is well known, is not unusual in persons who have submitted to amputation after having gone through with a long suppuration from a diseased limb.

Two years afterwards, he was seen, quite well, and still increasing in weight. His figure, instead of being distorted, as before the operation, was erect; and he walked well with a Palmer leg.

CASE CCXLI. — *Amputation of Thigh for Anchylosis of Knee-joint. Necrosis of Tibia, and other Disease.* — May 3, 1866, a young man of rather weak and sickly appearance, 20 years of age, entered the Hospital for an amputation of the thigh. Three years before, he fell, striking his left knee, producing a swelling and inflammation of the knee and leg which confined him to his bed twenty-two months. A year after, a large portion of the front of the tibia, in a necrosed state, was removed.

On investigation, I found the affected knee larger than the other, stiff and painful. Above it were the cicatrices of two ulcers; below, a depression, marking the position where the bone had been removed. Close to this, a sinus existed, running upwards and outwards to the inner condyle of the femur, where dead bone could be felt. The foot was inverted, presenting the appearance seen in talipes varus, which, the patient said, took place when he attempted to walk after the operation for necrosis. There was not only inversion, but extension to such a degree as to give the appearance of talipes equinus: the leg was shortened four inches. The limb, being entirely useless, was amputated, May 5th, with an anterior flap of skin; a circular cut being made behind, so as to bring the cicatrix on the back part of the stump.

The patient did pretty well until May 31st, although there was some suppuration in the stump and retraction of the flaps, when an abscess formed on his left hip, which was relieved by an incision. In this, as in some other cases, where a retraction of the flaps occurred from suppuration in the stump, a very

rapid cicatrization took place, from extension made on the integuments with adhesive plaster and a weight. On the 19th of June, he was well enough to go home.

The following is the description of the amputated portion : The tibia and fibula were dislocated on the back part of the femur, and anchylosed to it and to each other ; the patella was anchylosed to the external condyle. On the front part of the tibia, a long and deep sulcus existed, from which had been removed a sequestrum of the whole calibre of the bone, nine inches long, which the patient carried with him. The foot was in a complete state of extension, combined with slight eversion, so as to form an almost continuous line with the tibia, and in a state of false anchylosis.

CASE CCXLII. — *Amputation of both Thighs for Railroad Injury. Death twenty-three days after.* — On June 2, 1864, a man was brought into the Hospital, who, two hours before, was thrown from the railroad track by the engine. He sustained a compound comminuted fracture of both bones of each leg, with deep ragged wounds near the ankles. When brought in, he was almost in a state of collapse, having lost much blood. Stimulants were freely given, which were followed by some re-action. He was etherized, and both legs amputated just above the knee-joint by the circular method. But little blood was lost during the operation. Four vessels required ligatures in the left, and three in the right stump. The patient was so depressed during the operation, that it was necessary several times to suspend the use of the ether, in order to ascertain his exact condition. He rallied, however, from the operation well ; and, being put on a nourishing diet with sufficient stimulant, improved until the 17th, when he had a severe chill, followed in a day or two by sloughing of the integuments covering the ends of the stumps. From this time he gradually sank, and on the night of the 25th died.

Nature seemed to have made a great effort, in this case, to sustain itself against the great shock of the injury, and also to repair it. But in spite of all the natural efforts, assisted in every way by art, it was unable to accomplish the process. For two

weeks, he promised as well as any case after a simple operation. He was then seized with a chill, as stated above, and slowly sank.

CASE CCXLIII. — *Amputation at the Hip-joint for a large Osteo-sarcomatous Tumor of the Femur. Recovery.* — A young man, 16 years old, of very light complexion and reddish hair, entered the Hospital, March, 1859. He was born in Maine, of healthy parents, and, so far as was known, with no scrofula in the family. His employment for a year had been that of shoemaking. About seven months before he entered the Hospital, at the upper and front part of the thigh a deep-seated tumor made its appearance, immovable and slightly painful. It increased slowly in every direction, until he was brought to the Hospital in the last week of March, 1859. At this period, the left femur, which was the seat of the disease, was slightly flexed on the pelvis; and the upper half of it was occupied by a large, firm tumor, making a very distinct projection in front, but more indefinite behind, where it mounted up, and was lost in the nates. The front part of it was somewhat nodulated, and was in immediate contact with, and partially pressed up, Poupart's ligament. The skin was everywhere movable on the surface of the tumor, except on the outer side, where a slight redness existed, caused by the application of a blister. There was a moderate degree of mobility of the joint, sufficient to show that the articulation had not been invaded by the disease. The patient could use the limb a little, and was able to walk out with support, though very lame. The glandular system generally was intact. The appetite was poor. He had no fever. The pain in the tumor required the use of an opiate at night. The circumference of the limb over the tumor was twenty-two inches; the measurement of the corresponding part of the opposite thigh, fifteen inches.

Having made an examination of his case, I told the brother of the patient, that all applications were useless, and the only remedy left was amputation at the hip-joint. The case being so important, on the following day I called a consultation of the surgeons of the Hospital, which resulted in the following con-

clusions: That the disease was probably an osteo-sarcomatous affection of the femur, which, if left to itself, would very shortly terminate the patient's life in a most painful manner; and the only thing to be thought of was the removal of the femur at its articulation with the hip-bone. On the other hand, from the size and situation of the tumor, that the operation was an exceedingly hazardous one, more so than in the ordinary cases of its performance; that there was a possibility of his dying during the operation, or within the subsequent ten days; and, even if he recovered from the immediate shock, that there might be a re-appearance of the disease; that these conditions being properly placed before the patient and his friends, if they concluded to take the risk, the operation ought to be done. This question having been fully weighed by the patient and his brother, they decided to have the limb removed, rather than run the risk of submitting to the lingering course of the disease.

The operation was performed in the following manner, on Monday, March 28th, the fifth day after his entrance into the Hospital. The ordinary method by transfixion being impracticable, and in view of the possibility of a dissection of the tumor from its attachments, a large flap of skin was raised from its front part; the incision commencing at the root of the scrotum, and terminating just above, and in front of the great trochanter. The flap was dissected up quite to Poupart's ligament, the fascia over the femoral artery opened, the vessel exposed, a ligature passed around it and tied. An incision was then made on the back part of the thigh, corresponding with that in front, and a flap of skin partially raised. With a short, strong knife, the muscles running from the pubes to the inside of the tumor were cut through, and those on the outside treated in a similar manner. These incisions loosened the thigh, which had before been confined, and allowed it to be depressed and rotated outward. It was necessary to do this to a great extent, on account of a lobe of the tumor projecting over and obscuring the articulation. The knife was next applied to the capsule, which was divided, the round ligament snapping off at the same time from the powerful force applied to it. The bone was then disarticulated, the great muscles of the thigh cut through behind, and

the limb removed. A very large sponge was thrust into the wound, to prevent bleeding, while the smaller vessels in the flap and trunk were secured. By the skilful compression of the abdominal aorta by Dr. Gay, the immediate seizure and compression of the flaps by Dr. Cabot, together with the previous ligature of the femoral, scarcely any blood was lost. The vessels in the flaps were successively tied as they were uncovered by the removal of the sponge: it was also found necessary to secure the great femoral vein.

The lips of the wound were brought together by a number of sutures; a compress was applied, and a very large sponge, to make gentle compression, and fill up the deep cavity in the side of the pelvis; over this a towel, and the whole firmly secured by a bandage. The operation was necessarily protracted much beyond the usual time of an ordinary disarticulation; yet after its termination, and just before the removal of the patient from the table, his pulse was as good as before the operation was commenced.

A section made of the tumor and the femur, which were sawn longitudinally through the middle, presented the following appearances: The tumor was beautifully variegated, and presented the ordinary aspect of osteo-sarcoma. It had its origin between the periosteum and the bone, and extended from the middle of the femur quite to its neck. The periosteum covering the greater trochanter had been peeled up, and the sac of it filled with that yellow oleaginous fluid which is so frequently seen in tumors connected with the bone. The parietes of the bone were somewhat thickened in the centre, thinned toward either extremity, and the medullary cavity was almost obliterated. The substance of the tumor itself was quite firm, having the ordinary appearances of carcinoma interspersed with spiculæ of bone. A microscopic examination of it was made by Dr. Ellis, and verified the diagnosis. The head and neck of the bone seemed to have completely escaped invasion. The muscles covering the tumor were partially adherent to it, but none of them so completely incorporated with it as at first had been feared. The tumor seemed to have been entirely enucleated; and, so far as could be ascertained, not the slightest trace of it was left behind.

In the afternoon of the day of the operation, the patient seemed to be in a good condition, and complained only of the tightness of the bandage around his body. This was loosened by cutting it away partially, and completely removed on the following morning. He passed a pretty good night, under the effect of a drachm of the solution of the sulphate of morphia, complaining principally of an excessive thirst, which no amount of drink seemed to satisfy, and which I attributed partly to the ether. On March 30th, the thirst was somewhat alleviated, but he was still without appetite, and complained of a little soreness in the groin; pressure gave pain in the lower part of the abdomen. The pulse was 100.

The following day he took an enema, which emptied his bowels, and seemed to improve his appetite, so that he chewed a little beef; also took brandy and water and milk punch, to which he was much averse, never having taken spirit in his life.

On Saturday, April 2d, the wound began to be rather offensive; and at the suggestion of the venerable and distinguished Professor Mussey, who was present, the dressings were removed, and a yeast poultice applied: the pulse was rather over 100; the appetite still doubtful. On Monday, the 4th, his pulse was 120; there was profuse sweating while sleeping; he began to take his food more regularly, and his pulse to have considerable firmness. He was allowed bread, tea, and baked apple for breakfast; bread, meat, and baked apple, of which he was very fond, vegetables, with brandy and water, for dinner; for supper, the same as at breakfast; at bedtime, and to drink through the night, from half a pint to a pint of milk-punch. On the 8th of April, he was reported as doing well: "He makes no complaint, the pulse is about 100, and he may be said to be in a convalescent condition; the bowels are emptied every other day by enemata, and he has taken no purgative medicine since the day of the operation."

The patient went on improving till the third week after the operation. The wound healed well, leaving an aperture at either end for the escape of ligatures. About the twenty-fourth day, on waking in the morning, he felt a pressure at the inner

part of the stump ; and, shortly after, a stream of blood slowly trickled down. Dr. Ezra Dyer, the house-surgeon of the Hospital, was immediately summoned, and by means of a sponge applied over the apertures from which the ligatures issued, and a strong compressing bandage, succeeded in arresting the bleeding. The bleeding recurred again in about two hours, and was arrested in the same way. When I saw the patient, at 9, A.M., he was rather pale, his pulse rapid, and his system had evidently received a severe shock. He was not much alarmed : but, on this and the following day, made great complaint of excessive thirst, as he did after the operation ; showing that it was the loss of blood, and not the ether, which previously caused this symptom. From the free escape of blood at the time, and its arterial color, it was thought probable to have escaped from the great vessel, in consequence of the ligature having partially detached itself ; and for this reason it was deemed prudent not to interfere with the wound for the next two or three days. No new bleeding having occurred, I then had all the dressings removed. The two ligatures at the outer part of the stump were seized by the fingers, and withdrawn with very slight force. The four ligatures at the internal part of the stump were then separated, and dragged upon singly ; and all of them were removed without difficulty. The two large ones, which had been attached to the femoral artery and vein, had probably been for some time detached, and lay coiled up in the wound, causing irritation and suppuration, and probably the hemorrhage which had given the alarm.

From that time the wound rapidly healed. The patient left his bed in about a week, and in ten days was able to go out of doors. May 10th, he returned home quite well.

Remarks. — This case is worthy of notice from having been the first of amputation at the hip-joint that has succeeded in Boston. The following statistics, from Mr. Erichsen, in his valuable work on Surgery, may be interesting, as showing its mortality : Of 126 cases, 76 died ; of 47 cases in which it was done for injuries, 35 died ; of 12 cases operated on in the Crimea, all died. During the late American war, as nearly as I can learn, there were 23 cases of amputation at the hip-joint, of

which 5 recovered, and 18 died. Of these, 10 were primary operations for gunshot wounds, of which 3 recovered, and 7 died; and 13 secondary operations for the same cause, of which 2 recovered, and 11 died.

The flaps in this case, being principally composed of skin, made the wound much less appalling and more manageable than where large muscular flaps are left, as in the ordinary operation. This may be considered worthy of imitation, even when not required by necessity, as in the present case. The previous tying of the artery, together with the compression of the aorta, allowed the operation to be performed in a perfectly comfortable manner, without the slightest hurry, and with almost a dry wound, if the expression may be used.

This patient lived for some months in very good health; but the disease returned internally, and he died within a year of the operation.

CASE CCXLIV. — *Amputation at the Hip-joint. Death thirteen days after.* — A child, six years old, was brought to the Hospital on the 19th of June, 1858, at three o'clock, having been injured about two hours before. He was sitting on the curbstone of the sidewalk, when a truck wheeled round against him, crushing his limb against the stones. His injury at first was not detected: being lifted up by some passer-by, and placed upon his feet, not being able to support himself, he fell, and received, in addition to his other injuries, a violent blow upon the forehead. When brought to the Hospital, his state was as follows: He was quite faint, countenance livid, pulse small. The integuments of the thigh, near the hip, were nearly cut through by a semicircular wound; and on the outside a deep wound in the muscles communicated with the bone, which was fractured obliquely, and denuded nearly up to the joint. As the blood was flowing from this extensive wound, the case admitted of no delay; and amputation was at once performed. The boy was first stimulated with as much spirit as he could bear, and ether was administered, which quickly brought up the circulation. The limb was then separated at the fractured part, Dr. Shaw compressing the artery. Dissection was next made

at the side of the bone, which was disarticulated with difficulty, both from the anatomical relation of the parts, these being obscured by ragged muscles, and more especially from the remaining portion of the femur being too short to be easily controlled in effecting the disarticulation. The capsule was, however, opened, and the bone dissected out with but little delay. The boy at this moment became deadly faint, and was only restored by using frictions of brandy and ammonia; the latter being applied also to the nostrils. He was likewise suspended by the remaining leg so as to throw the blood to the brain; and, under this treatment, soon revived, although at one moment he seemed to be dead. The vessels were now tied, and the wound temporarily dressed. Just as this was finished, he a second time came in peril of his life. As is often the case with patients recovering from ether, he seemed disposed to vomit; and, in fact, a basin was held, and he threw up a large quantity of liquid substance. Immediately after this, he fell back as if exhausted, a cold sweat came over him, and the respiration and pulse ceased. The frictions, and other means for restoring suspended animation, were at once again resorted to; and I proceeded to pass the finger into the mouth for the purpose of raising the epiglottis and making a passage for the air into the windpipe, when it encountered a mass of solid potato-like substance, with which, on further investigation, the whole mouth and fauces were found completely blocked, so as entirely to exclude the air, and almost suffocate the patient. The teeth had allowed the liquid contents of the stomach to pass between them, but had acted as a strainer to retain the solid matters in the mouth. The mouth being now cleared, and artificial respiration set up, the child gradually commenced to breathe, and, in the course of half an hour, was in a safe state. At 9, P.M., the limb was dressed, and he was taken to his bed in the ward. The patient lived thirteen days, and received during this time the most unremitting care from the nurse in charge of him, and from Dr. Dyer, the house-surgeon of the Hospital. The stump, during this time, became quite sloughy; and one or two abscesses formed in the groin. The whole wound, however, finally assumed a healthy appearance; and, when there seemed to be every pros-

pect of his having gone safely through the most dangerous part of the trial, he suddenly failed and died, nearly a fortnight after the reception of the injury.

The following table exhibits the results of the operations for amputation of limbs at the Massachusetts General Hospital, from January, 1822, to January, 1866, — a period of forty-four years : —

	TOTAL.	RECOVERED.	DIED.	PER CENT OF DEATHS.
Thigh	204	149	55	26.96
Leg	196	139	57	29.08
Arm	65	55	10	15.3
Fore-arm	53	45	8	15.09
Hip-joint	2	1	1	50.
Shoulder-joint	19	12	7	36.8
Total	539	401	138	25.6

EXCISION OF JOINTS.

The excision of diseased joints, as a substitute for amputation, which was revived some years ago by Mr. Syme, — more particularly for the elbow and shoulder, — has since been practised on most of the larger joints of the body, and has passed into surgery as one of the established operations. The excision of the knee, in particular, has been much more frequently performed than that of any other large joint; the diseases which, in civil practice, require surgical interference, being more frequent in the case of the knee than of the elbow. By this operation, many limbs, which would otherwise be condemned to amputation, are saved, and made useful. Excision of the knee is, of course, applicable only to cases in which the limb is otherwise sound, and the movements of the hip and ankle unimpaired. Performed upon adults, it already counts a great number of

most admirable results : but, in the case of young children, a very grave objection has arisen from the fact, that, in several instances, at first reported as successful, the growth of the limb has been arrested ; leaving it, at last, many inches shorter than its fellow. There is no doubt, that, if the epiphyses of the bones are wholly removed, the subsequent growth of the limb is impaired. It is therefore proper, in children, to pare off from the articular surfaces as thin a slice as is consistent with the removal of the diseased bone and the whole articular cartilage. One case in my own practice, given below, in a little girl of about eight years of age, an entirely useless and bent-up limb, the result of scrofulous white swelling, was made serviceable by removing the ends of the bones, and straightening the joint. I saw this patient, at the end of three years, perfectly well, and walking with a slight limp. The limb was shorter than the other ; but the pelvis had so adapted itself as to make the loss of length less evident than might have been expected.

I have performed excision of the knee-joint three times, for caries, with most gratifying success. In a fourth case, — that of an adult female, — which, from the first, seemed a less promising one for the operation than the others, amputation was afterwards necessary.

In two or three excisions of the shoulder-joint for caries, the results have all been successful.

The advantages of excising the head of the humerus and the articular surfaces entering the elbow-joint are undoubted.

Barton's operation, removing a wedge-shaped piece of bone for a contracted and distorted limb, is one well worthy of imitation. I have introduced below two cases in illustration of it.

CASE CCXLV. — *Excision of External Condyle of Right Humerus.* — Nov. 27, 1854. A man, 24 years of age, being on the cars while they were in motion, stepped off, and was thrown against a rail, which penetrated his arm above the elbow, tore open the integuments, and broke the external condyle into the joint. He entered the Hospital the same day. I saw him first on the 29th. The arm was then swollen, and there was a moderate discharge from the wound. The condyle was com-

pletely loose and denuded, so that it was dissected out and removed without any great difficulty, and the wound left open. On the following day, a yeast poultice was applied to the elbow. On the 13th of December, a small abscess formed on the elbow, which was opened, and discharged freely. In order to support it with as little pressure as possible, the arm was laid on a bladder partly filled with water. Jan. 10th, another abscess formed on the outside of the wound, which had then nearly healed up. On the 20th of January, he left the Hospital, the wound entirely healed, the joint possessing but little motion.

About six months afterwards, he presented himself, having recovered a good motion of the joint.

CASE CCXLVI. — *Excision of the Shoulder-joint for Caries. Recovery.* — 1853. The patient was a man, 60 years of age. Three years before, the disease first manifested itself by a pain in the shoulder. In 1852, swellings appeared about the middle and outer part of the arm, which were opened, and gave issue to a large quantity of pus. The inner part of the arm was soon after affected in the same manner; also, over the pectoral muscle on the thorax. The openings left by these abscesses were probed, but no dead bone could be discovered.

The motions of the shoulder-joint became almost abolished; and the discharge of pus was so large, from the fistulous openings in the arm, as to greatly weaken the patient. An incision was therefore made from the opening nearest the shoulder-joint towards the head of the bone, which was found to be carious, though not extensively so. The wound was kept open in the hope that ankylosis would take place, and thus avoid the necessity of an operation.

A month later, no improvement having taken place, the patient was etherized, and the old incision enlarged. The os humeri and glenoid cavity were found to be carious to such a degree that an operation was absolutely necessary; and it was performed as follows:—

A triangular flap was raised from the shoulder, so as to expose the head of the bone. The strong adhesions between it and the socket were then cut through, which, with a little dis-

section, allowed the head of the bone to be turned out and sawed off. The socket, being carious, was next removed by the cutting forceps. The wound was closed by a few sutures, and some strips of adhesive plaster applied.

At the time when he left the Hospital, the discharge from the various sinuses was decreasing rapidly; and the large cavity left by the operation had been quite filled up. His health was excellent.

I saw this patient again in 1855. His condition was as follows: The left shoulder, front part of the chest, and integuments over the scapula, were covered with puckered cicatrices, the result of the numerous abscesses caused by the original disease. The upper part of the shaft of the humerus was a little in front of the old glenoid cavity. The motions of the fore-arm and hand were perfect, so that he was able to work at his employment — stocking-weaving — for ten hours a day, which requires the constant motion of these parts. To facilitate the use of them, and to relieve the shoulder, a sling was suspended from the ceiling, in which the arm was placed; and, by this means, he suffered no inconvenience from the constant strain which otherwise would have fallen upon it. He had the full command of his hand and fingers, and could grasp things with nearly as much strength as with the other hand. He could not raise the hand to the mouth without inclining the head a little forwards; nor could he extend the arm to its full length, directly before him. With these exceptions, he could move the limb in all directions.

CASE CCXLVII.—*Excision of the Knee-joint.* — D. L., 32 years old, a handsome, fresh-looking man, five feet eight inches in height, entered the Massachusetts General Hospital, March 23, 1857, for an affection of his right knee. Three years before, he had what was supposed to be a rheumatic attack in this joint, which lasted three weeks. Five months previously, the knee became painful and swelled, and he was confined to his bed for three weeks with it, but afterwards was able to walk without crutches. When he entered the Hospital, the joint measured three inches more in circumference than the sound

or left knee. There was great thickening of the capsule, which gave the impression of its having undergone a long inflammatory process; there was also fluctuation, but no pain except on free motion.

A gutta-percha splint, extending from the hip to the toes, was moulded to the back of the limb, so as completely to prevent the motions of the knee and ankle joints. Counter-irritation was made by the free use of the tincture of iodine. Under this treatment, the knee-joint, in four weeks, had diminished an inch in circumference. As the absorption, although gradually progressive, did not seem to be going on with sufficient activity, two deep issues were made, on May 7th, above the joint; and, on the 20th, two more below. The improvement from these applications was very great, so that on June 16th, at his own request, he was discharged from the Hospital, much relieved.

This patient kept about until June 2, 1858, when he again entered the Hospital, by my advice; the disease having assumed a more troublesome form. The knee was quite painful, at times swollen, and almost useless. He was unable to bend it, and was obliged, in walking, to swing the limb forward between his crutches. It was his wish to have amputation performed; but, on consultation, it was decided to give him the chance afforded by excision of the joint, and he readily consented to follow my advice. The operation was performed on June 5th, in the following manner: A semilunar incision was made, commencing over the inner condyle of the femur, extending down to the tubercle of the tibia, and terminated over the outer condyle. The whole flap was dissected up, and the joint exposed. Some adhesions existed, and an attempt at ankylosis had been made; but the cartilages were in a great measure destroyed, and the bones eroded. The patella was firmly fixed to the femur, and did not participate in the disease, so that it was determined not to interfere with it. The condyles of the femur were sawn off, as also was the head of the tibia, by a narrow saw, like Butcher's, which was arranged to cut on the inner instead of the outer edge, the saw being reversed in the handle. This was engaged under the condyles of the femur, and divided the bones with the accuracy of a knife. A common

saw would not have been available, in consequence of the protection of the patella; and, but for this arrangement, a chain-saw would have been required. On the top of the tibia, a tubercular deposit still remained, which was completely removed by a gouge, leaving a cavity about a quarter of an inch deep. The head of the tibia was so cut as to leave its edges a little more dependent than the centre, in order to favor the escape of fluids. The bony surfaces being carefully placed in apposition, the flap was secured in its situation by numerous sutures, and the wound covered with a little scraped lint soaked in blood. There was very little hemorrhage, and only two small arteries were secured. The limb was then placed in a gutta-percha splint, nicely padded, which had been carefully prepared before the operation, and moulded exactly to its shape. The splint reached from the nates to the foot, so that the whole of the lower extremity was perfectly confined.

For the three days subsequent to the operation, the patient slept well, without pain in the knee or fever. On June 8th, when the leg was raised from the splint and dressed, the wound was found to have united, except at the outer edge, where there was a discharge of pus. He was remarkably comfortable, and experienced but little pain from the dressing. He was allowed house diet.

On the 11th, the limb was again taken out of the splint, and a collection of pus was found on the outer, but none on the inner side. The appetite was not very good, and he was therefore ordered the compound tincture of gentian. On the 14th, the limb was again dressed, and the wound was found to have discharged somewhat more than at the last dressing. The incision below the patella had apparently united by the first intention, and only the ends were open to allow the escape of the pus. His appetite was much better.

This patient continued to improve, and left the Hospital in about two months, not having had a bad symptom from the date of the operation. In November, he was present at a meeting of the Boston Society for Medical Improvement, having walked nearly a mile from his residence. At this time, he was partially disabled by a nail growing into the flesh of one of the toes on

the side operated upon, so as to require the use of two canes in walking. Bony union seemed to have taken place between the femur and tibia. The wound had apparently healed; though, at a small spot, it occasionally opened, and discharged slightly.

The recovery of the use of the limb in this case was quite rapid, and he was out as soon as a patient after an ordinary amputation. The superiority of the single over the double flap, when it can be made, both as regards appearance and position of the wound, need hardly be insisted on.

CASE CCXLVIII. — *Excision of the Knee-joint for Caries. Recovery.* — A girl, 14 years of age, of light complexion and red hair, entered the Hospital on April 28, 1859, during my service. About six years before, she had an affection of the right knee-joint, the origin and course of which she was utterly unable to describe, which left her lame, and the limb slightly contracted. Nine months before coming to the Hospital, she entered a factory in Lowell, where, for a good part of the day, she was obliged to keep her knee in a bent position against the machine at which she worked. This brought on a recurrence of pain in the joint, some swelling, and further contraction of the limb, so as to disable her from walking, and require local applications to relieve the tenderness of the joint. She came to the Hospital with the idea of having the limb removed, if it were thought advisable by the surgeons.

The right knee-joint was about one-third larger in circumference than the other, and the natural depressions about it were obliterated. The leg was bent on the thigh, so that, on standing up, the toes did not reach the floor by nearly two inches; the diseased knee being pressed against its fellow, and the inner edge of the foot coming to the ground. The surgeons of the Hospital agreed with me, that the case was a very favorable one for excision of the joint, and that this operation was to be preferred to removal of the limb.

On the 30th of April, she was etherized; and I made a horse-shoe incision over the knee-joint, which was found to be closely invested by a dense covering, consisting of the disorganized synovial membrane and cellular tissue: the cartilages were

eroded at many points, and the condyles of the femur and head of the tibia were necrosed. About half an inch was sawed from the femur, and a quarter of an inch from the head of the tibia; all the diseased bone was removed, and the patella dissected out. There was very little hemorrhage. The femur and tibia were brought into proper apposition, care being taken that the excised ends should not be too tightly brought together; the flap was confined by sutures; and the limb placed in a gutta-percha splint, and bandaged.

She passed a comfortable night, and did well, except that twice the action of the femoral muscles drew the tibia out of position, backwards and upwards. The patient, being of a scrofulous habit, emaciated, and of poor vitality, her convalescence was slow; and the limb required a good deal of management, by splints and dressings, to keep it in a good position, and promote the healing of the wound. She was taken out of doors early, and every means used, by food and tonics, to invigorate the system. It was not, however, until September, that she was sufficiently well to leave the Hospital, when the joint was firm. A slight superficial wound still remained. She was taken to her relations in California, and her future history is unknown. The case promised to be of successful issue.

CASE CCXLIX. — *Excision of the Knee-joint for Deformed and almost Useless Limb. Cure.* — A girl, 7 years old, born in China, was brought to the Hospital in April, 1861, for the purpose of having either the knee-joint excised or the limb amputated. Her parents were still abroad, and no satisfactory account of the case could be obtained. The knee was bent at nearly a right angle, and the patella was fixed. On attempting to walk, she came down upon the toes with a most awkward and hobbling gait. Her health was otherwise good. Excision was performed on the 24th of April. A semicircular flap was made in front of the joint, exposing the articulation. As delicate a slice as possible was then excised from the ends of each of the bones, by means of Butcher's saw. The patella, becoming detached, was removed. The bones were then approximated, the limb being straightened, and the flaps nicely

adjusted by sutures. The limb was then placed in a gutta-percha splint, which had been previously moulded to the proper shape, and secured by a bandage extending from the toes to the pelvis. She was not much depressed by the operation, but passed a restless night, and for two or three days was in an uncomfortable state. On the 27th, the wound had the appearance of having united by first intention; but, on the 30th, there was a slight discharge of pus. May 24th, nearly all the discharge had ceased; and, on the 28th, it was found that the bones had united. June 24th, a starched bandage was applied, instead of the gutta-percha splint; and she was taken out daily into the yard, and exposed to the sun. By the middle of July, she was able to walk, and, at the end of August, was discharged well.

I saw this patient about a year after the operation, and examined her carefully. The knee-joint was slightly flexed, from the weight of the body; and the limb appeared to be about two inches shorter than its fellow. The pelvis, however, had yielded so as to compensate for the loss in length in the limb, which appeared to be due in part to the want of nutrition, the limb having grown less than the other. She walked with a very slight limp; and the change produced by the operation was very striking, a serviceable limb being substituted for a deformed and useless one.

CASE CCL. — *Excision of Wedge-shaped Piece of Bone from Knee-joint for Anchylosis. Death from Pyæmia.* — A boy, aged 14 years, of large size, and good muscular development, in 1855 received a wound from an axe, on the right knee, which penetrated the joint. The injury was followed by severe and long-continued inflammation of the joint, finally resulting in an anchylosis, with the leg bent at a right angle with the femur. When I first saw him, he walked on the tip of the toes of the right foot, the left limb being thrown, in a bent position, forwards; so that a person seeing him in motion would suppose the whole osseous system more or less distorted. Being consulted in November, 1859, as to the possibility of straightening the limb by any mechanical force applied to it, I at once decided in the negative; the patella being firmly fixed

in its situation, and all motion of the joint, so far as could be perceived, destroyed. The only method of relief I could propose to him was an operation like that first suggested by Dr. Barton, of removing a wedge-shaped piece of bone from the joint, or its vicinity, which I had once before practised with success; that removal of the limb, even, was more desirable than allowing him to continue in his deformed and painful condition. His friends and physician, having taken the subject into full and deliberate consideration, decided to have the operation, which I proposed, performed; and the patient was brought down from the country, and placed under my charge at the Hospital.

The operation was done on Oct. 29, 1859. Previous to its performance, it was observed that the hamstring tendons in the different motions of the limb were powerfully contracted; and, in four or five cases of excision of the knee-joint which I have performed or witnessed, I have observed that these tendons formed an obstacle, at the time, to the straightening of the limb, and were very troublesome afterwards, during the treatment, dragging the leg backwards out of apposition with the femur. The operation was commenced, therefore, by the subcutaneous division of these tendons. The patient then being placed upon his back, a semicircular incision was made just over the knee-joint, commencing at the lower part of the inner condyle of the femur, extending around across the spine of the tibia, and terminating at the outer condyle. The flap of skin was then dissected up, and the remaining soft parts divided to the bone. The saw was next placed on the femur, just above the ankylosed patella, and the bone sawn a little obliquely downwards, so as nearly to traverse its thickness. The saw was then placed on the upper part of the tibia, just below the point where the old articulation was supposed to have been, and an incision made nearly at a right angle with the former, so as to remove a solid bit of bone, with the patella attached to the top of it. With a very little motion backwards, the remaining shell of bone was now fractured; and the size and shape of the piece removed were so exactly what had been intended, that it seemed as if there could be no difficulty in placing the limb at once in a

straight position : but, for some reason which could not be explained, and which was unconnected with muscular action, it was found impossible to do this, — a result I attributed to the head of the tibia having been partially displaced behind the femur ; and thus, while the whole circumference of the femur had been removed, only a part of the head of the tibia had been included in the incisions. The leg being bent forcibly backwards, so as to protrude as much as possible the ends of the bone, and the intervening bit of bone being cut away, the ends of both bones were fairly exposed, and a slice removed from each of them. The limb could now be brought out straight, and the eversion of the foot corrected. Liston's splint was applied, and the edges of the wound nicely adjusted by sutures. The hemorrhage, during the first incisions, was much more free than in any excision of the knee-joint I have practised. It was partly owing to the age and muscular development of the patient. The bony structure itself was also excessively vascular.

In the afternoon, the patient, having recovered from the effect of the ether, and having taken twenty drops of laudanum, was quite free from pain. There had been an oozing of blood, which wet the bandages in the vicinity of the joint. He passed a moderately quiet night, and on the following day made no complaint of pain, his pulse being between seventy and eighty in the morning. Towards evening, considerable re-action took place, attended with some heat of the limb, and fever.

On the next day, he was quite comfortable, complained of no pain, and began to take nourishment. The bandages, being foul, were removed as far as possible without disturbing the limb.

On the fourth day, the limb was taken completely out of the splint, entirely cleansed, and fresh dressings applied. The patient took cider, broth, and coffee, and expressed himself as getting along well. With the exception of an aperture on the inner side, at which the blood had escaped, the wound had united throughout by the first intention. A little redness existed over the outer side of the condyle of the femur ; and the patient having rolled over, on the first night after the operation, partly displaced the bone, and kept up undue pressure on it

through the night: the displacement was discovered, and adjusted on the ensuing day.

Every thing appeared very favorable until the seventh day after the operation, when he began to show some unfavorable symptoms: the pulse became more rapid, a languor and heaviness appeared, a disposition to sleep, and more or less loss of appetite. At the same time, the discharge from the wound became offensive. He was immediately put upon full doses of brandy and quinine, and great attention given to the wound, by frequent dressings and ablutions, to free it from the foul secretions as much as practicable. During this time, the limb above and below the wound looked well, and the circulation seemed to be perfectly normal. On the following day, an injection was made into the wound, three times, of the tincture of iodine. The symptoms of purulent absorption rapidly became more decided. The patient was very listless; the pulse 120: he made no complaint of any kind. By the next day, the skin over a portion of the flap covering the former joint had a sloughy look; and towards evening, in addition to former symptoms, he had difficulty in opening his jaws. He sank, and died on the following day, being the twelfth from the operation.

The body being immediately removed, no opportunity was afforded of making an examination. The symptoms were all those which would be caused by absorption of a poisonous material into the circulation, and were met, as far as could be, at once, when perceived. The part at which the operation was done was inspected, and the bones had all the appearances of having been bathed for a number of days in fetid secretions. There were no abscesses or collections in the vicinity.

CASE CCLI. — *Barton's Operation for Straightening the Knee-joint by Excision of a Wedge-shaped Bit of Bone.* — A man, 25 years old, from Nova Scotia, presented himself to me in September, 1850, on account of a great deformity of his limb, owing to an ankylosis of the knee-joint; the leg being bent at nearly a right angle with the thigh. He stated that his prospects had been destroyed and his life rendered wretched by his infirmity; and wished, if any thing could be done for him,

short of extreme danger to his life, that it should be attempted. The history of the case, as given by him, was this : In November, 1841, he fell a distance of three feet, striking the knee. Three days after the fall, the knee began to swell, and become painful. This went on for four weeks, when it was punctured, and a pint of watery fluid escaped. It continued to discharge for fifteen months, during which time many small pieces of bone came away. The opening finally healed, leaving the joint and limb in a distorted position. His hereditary tendencies were scrofulous. In the erect position, resting upon the sound limb, the lame foot was seven and a half inches from the ground ; but he could limp about with a high-heeled boot.

I informed the patient, that the only operation which suggested itself to me was Barton's operation, which had apparently been already described to him ; and at once he requested to have it performed. I advised him to enter the Hospital for the convenience of apparatus, which he did. Some of his friends attempted to deter him from running any risk ; but he said he was determined either to undergo the operation suggested by me or to have the limb removed, as he could no longer bear the pain and mortification of his condition.

On the 2d of October, the operation agreed upon was performed as follows : A V-shaped incision was made through the skin just above the knee-joint ; the base of the triangle, two inches wide, presenting outward, with the apex at the inner side of the limb. The flap was dissected up, and the bone exposed ; the other textures having become atrophied from disease. A wedge-shaped piece was sawn out of the femur ; the saw not being carried quite through, so as to avoid the artery. The remaining portion of bone was then broken ; the flap was secured in its place, and the knee placed on a double inclined plane, and firmly fixed to it. There was no hemorrhage.

On the following day, the patient said he had passed a restless night, but was free from pain. The limb was dressed on Oct. 7th, and placed on a splint with a hinge and screw, so that it could be extended without any shock to the joint. By the 20th, the limb had been gradually brought to a straight position ; and, on the 29th, the bones had united, and the

wound was healed. Some time after this, he had a febrile attack, in the course of which the union became somewhat less firm, and threatened to dissolve; the system showing its scrofulous tendency. He gradually recovered, however, and left the Hospital.

About a year after his discharge, this gentleman presented himself to me, well. The limb was very little shorter than the other; and, with a pair of large trousers, the difference in the shape of the two limbs could scarcely be distinguished. He walked well with a cane; and the improvement between his upright appearance in walking and his former method of locomotion would have almost prevented him from being recognized as the same individual.

In some cases, greater symmetry may be gained by making the excision directly from the joint, rather than above it, as there is then presented a much larger surface of bone.

The following table gives a brief *résumé* of the cases of excision of the joint before described, not including the two cases of Barton's operation : —

EXCISIONS OF JOINTS.

Age.	Sex.	Previous Condition of Patient.	Joint.	Cause of Disease.	Length of Time.	Condition at time of Operation.	Mode of Performance.	After-treatment, results, remarks.
32 years.	M.	Healthy.	Knee.	Rheumatism.	3 years.	General condition good; knee swollen, stiff, and painful.	Semilunar incision; condyles of femur and head of Tibia sawed off; patella left, adherent to femur.	Treated with straight splint; slight suppuration; union almost wholly by first intention; perfectly well in 2 mos., and remains so now, 6 years after.
7 yrs., 9 mos.	F.	Strumous.	Knee.	Strumous disease.	Several years.	General condition good; knee bent at right angle, fixed.	Semilunar flap. patella removed; also, both articular surfaces, thin slice of each.	Straight splint; healed with some suppuration; could walk in 4 mos.; end of 5 mos., well. Seen 1 yr after operation. Slight flexion, and limb apparently 2 in. shorter than other, but compensated by a deviation of pelvis; walked with very slight limp. Is still well, 4 yrs. after.
14 years.	F.	Very scrofulous.	Knee.	Scrofula.	9 mos.; knee had not been well for 6 years before; slightly contracted and lame.	Much swollen, bent, and also abducted; limb useless. General condition feeble.	Whole joint excised, patella removed; thin slice from femur and tibia.	Walked after 3 mos.; straight splint; a small fistulous opening left when discharged. Went to California, and not since heard from.
19 years.	F.	Scrofulous.	Knee.	No local cause.	2 years.	Very severe pain in joint; swollen; straight, and very tender. Health failing.	Semilunar flap; whole joint and large mass of diseased tissue removed; patella healthy, not removed; much bleeding.	Straight splint; great suppuration; want of union; final amputation, and recovery.
60 years.	M.	Healthy.	Shoulder.	Caries.	3 years.	No motion of joint; great purulent discharge.	Triangular flap, head of bone and socket removed.	Recovery with almost complete use of arm. Seen 2 yrs. later, with bone a little in front of normal position; motions of fore-arm perfect. Is employed 10 hours a day in stocking-weaving, an occupation which requires the very free use of the limb; very free motion at shoulder.
41 years.	M.	Healthy.	Shoulder.	Caries.	6 years.	Whole joint diseased.	Head of bone sawed off; socket, which was loose, removed with forceps.	Great hemorrhage at time; healed by granulation; 3 mos. after, still fistulous opening on top of shoulder; 10 mos. after, two openings; but no bone to be felt in either. Cure but partially successful.

CHAPTER IX.

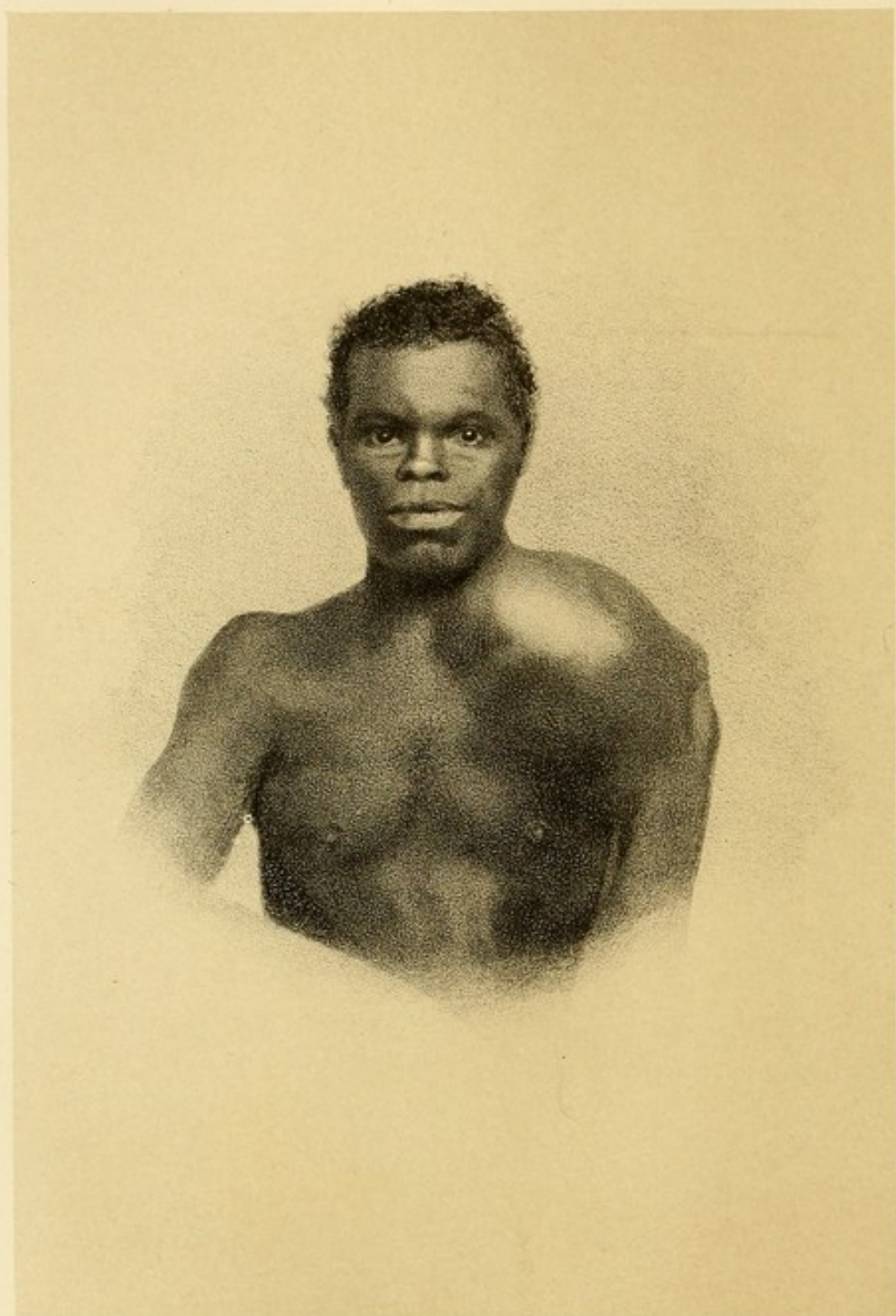
ARTERIES AND VEINS.

ANEURISMAL TUMORS AND LIGATURE OF ARTERIES.

THE introduction of the method of treating aneurismal tumors, either by compression on the vessel above the tumor, or compression on the tumor itself, in the place of the severe and dangerous operation of tying the artery, gave an additional impulse to the treatment of these diseases. The distinguished surgeon, Mr. Syme, has advocated a revival of the old operation of opening the sac itself, and tying the vessel above and below, in appropriate cases.

The following cases illustrate, by one or two examples, the treatment of compression of the tumor directly. An interesting case of femoral aneurism treated by immediate compression, under the care of Dr. B. Brown, which I saw in consultation, is published in the "Boston Medical and Surgical Journal" of March 15, 1866. The tumor in this case was in the femoral artery, just at its exit from the pelvis. The compression was made by means of ingenious apparatus, continuing through a period of about eight months, and with full success; substituting a treatment without danger for the very serious operation of the ligature of the external iliac artery. One or two cases are given of the old Hunterian operation, and one where death occurred after ligature of the parotid artery from the recurrent circulation. The compression may be made either with the fingers, — in which case it is kept up for several hours by relays of assistants, — by long-continued and extreme flexion of the limb, or by special instruments contrived for the purpose. In two cases of very large subclavian aneurism, which I have treated by the direct pressure upon the tumor of a heavy weight, in the





shape of a cannon-ball, and where the Hunterian operation was impossible, I have been so fortunate as, in one instance, to effect the complete obliteration of the artery; and, in the other, to produce coagulation of the contents of the sac, followed by supuration and sloughing, resulting in the perfect cure of the disease.

CASE CCLII. — *Subclavian Aneurism treated by Compression and other Means. Recovery.* — (Plate II.) A colored man, 39 years of age, from Machias, Me., was sent to me, March 2, 1854, having a large aneurism of the left subclavian artery. I was called down stairs early in the morning by the statement that a black man in a dying state was lying under the staircase. The patient stated that he left Gloucester in a vessel about a week before, and had been kept out by stress of weather, and finally had been landed at a distant point, from which he had walked to Boston. He was suffering much from excessive pain in his arm, which was enormously swollen, had an asthmatic cough, and great dyspnoea. He was immediately transported to the Hospital, where, being placed in a warm bath and thence into bed, the circulation became more free; and he gradually got into a more comfortable condition. The following account is taken from the Hospital records: —

"Hard-working man; strained himself fourteen months ago. Has had uneasy sensations about shoulder since that time. First noticed tumor above clavicle in July, 1853; worked until Feb. 22, 1854, when pain in tumor and arm obliged him to quit. Now, pulsating tumor over clavicle, its anterior inferior portion one inch from sternal end of clavicle. Circumference of tumor, $7\frac{1}{2}$ inches. Hand and arm have been swollen all winter."

After his admission to the Hospital, a consultation of all the surgeons was called, and the question proposed as to the propriety of any operation being attempted for his relief. The whole triangle of the neck above the clavicle was filled with the tumor, which extended nearly to the sternum, so that any prospect of tying the vessel on the cardiac side seemed to be impracticable: and the only operation which was at all feasible was to apply a ligature to the artery, as it issued from the tumor, be-

low the clavicle; a project hardly worth attempting. The following treatment was therefore resorted to:—

From the 12th of March to the 30th of April, cold applications were made to the aneurism, varied with compression by weights. There was no diminution in its size, indeed it rather increased during his stay in the Hospital; nor much amelioration in the symptoms, except that of pain, which was entirely assuaged by means of compression. The patient's general health was considerably improved.

May 4th. Discharged much relieved.

On May 1st, being obliged to leave Boston for Europe, I lost sight of this patient. Some months after leaving the Hospital, he was admitted to the State Hospital at Rainsford Island, where he came under the care of Dr. J. R. Lothrop, physician and surgeon of the place, and now of Chicago, who has been kind enough to give me the sequel of this remarkable case.

"As nearly as I can remember, Williams was admitted to the Hospital at Rainsford Island in October of 1854. He stated that he had fallen upon the shoulder of the affected side a few days before, and suffered much pain in consequence. The tumor was tender to the touch; motion gave great pain; and the only position which he could bear, was to lie on the sound side. The skin over the tumor was tense and shining; there was no pulse at the wrist; his arm was powerless and œdematous, and dropped, as can be seen by the picture. The tumor had more the appearance of a large abscess than of an aneurism. There was no tremor or pulsation in it, or communicated to the hand; no sound or aneurismal murmur.

"In about three weeks the pain ceased, and the patient was able to get up and put on a shirt for the first time; rallying quickly from the effects of the general constitutional disturbance, which had been quite severe.

"In time, the tumor began to point perceptibly nearly over the middle of the clavicle; the skin gradually becoming thinner. I do not recollect the time when spontaneous rupture took place; but I think it was during March, 1855.

"When the opening took place, there was a profuse discharge of mixed blood and pus, dark and rather thick; in quantity

about two quarts. It continued to flow two or three days, gradually decreasing. A purely purulent discharge continued for several months: in fact, when the patient was discharged in June, there was even then a slight flow of pus from the opening. No bad symptoms accompanied or followed the spontaneous opening of the tumor: on the contrary, Jack was in high spirits at an event which he had all along been wishing for, the getting out of the 'corruption.' He had predicted, that, when the 'corruption' was all out of it, he should be all right; and he often begged me to 'launch' it. In a short time after the rupture, he was up and about.

"The tumor rapidly subsided, and was followed by a depression. The shoulder fell forward. An opening remained one-half or three-fourths of an inch in diameter, into which opening projected a pointed and carious end of the humeral portion of the clavicle. The sternal portion was not visible. The middle portion was wanting. When he left the hospital, he had no distinct pulse at the wrist, and the arm was still powerless; but his general health had greatly improved, and he felt himself able to resume his old employment of ship's cook, which he actually did soon after.

"About a year after Williams left the hospital at Rainsford Island, he presented himself at the boat-house in Boston, with his arm in a sling, but otherwise in good health; and I understand that a letter has since been received from him, in which he stated that his health continued good."

CASE CCLIII. — *Aneurism of the Right Subclavian. Treatment by Compression. Cure.* — May 14, 1857, a mechanic, from Scotland, 41 years of age, came under my care, having an aneurism of the subclavian artery, occupying the whole triangle of the neck above the clavicle. The tumor, when first noticed, thirteen months previously, was situated about the middle of the clavicle. Being a strong, active man, in the enjoyment of good health, he gave very little attention to it at first. He had been employed twenty-seven years in the manufacture of steam-engines, and much exposed to changes of temperature.

The tumor presented three projections ; and, from its original size of a pigeon's egg, had extended the whole length of the clavicle. As it increased, he began to suffer from pain in it, attended with shortness of breath. On stooping, a sensation of weight, accompanied with throbbing, was produced in it.

No operation seemed feasible in this case, and it was therefore submitted to the following treatment : He was placed on his back, in bed, and kept on a limited diet of a pound of solid and a pint of liquid food every twenty-four hours, without meat. Bags of ice were applied to the aneurism on the 17th, and, in less than two hours, produced a very sensible effect in reducing the pulse. On the 19th, compression was tried with Dr. Arnott's air-cushion, which was applied through the day, with the exception of three intervals of half an hour each, when bags of ice were substituted. On the 21st, he complained of more pain in the lower lobe of the tumor ; also some in the two upper lobes, and a feeling of numbness in the arm of that side. Ice was used for fifteen minutes, instead of half an hour. Compression was discontinued, from the impracticability of making it equally over the whole tumor, on account of its irregular surface and large size. On the 27th, having complained of more pain in the smallest projection, the ice was discontinued. On Aug. 12th, he left the Hospital, apparently not much relieved : but, in fact, from this time the tumor gradually subsided ; and, about a year afterwards, he came to the Hospital, and said that the tumor had entirely disappeared, and he was quite well. Unfortunately, I did not see him at the time, and was unable to verify the exact condition of the subclavian artery and pulse of that side.

Remarks. — The ice and compression, together with rest, seem to have given an impetus to the tumor in both cases ; in the one leading to an obliteration of the sac, and in the other to suppuration and a destructive inflammation. The appearance of the tumor in the former case, when first seen by Dr. Lothrop, some months after leaving the Hospital, being such as to lead him to suppose it a large abscess, and that some error must have been made in the diagnosis at the Hospital as to its aneurismal character ; so entirely unlike such an affection did it appear

to him at that time. Whether owing to treatment or to natural causes, the ultimate recovery of two such apparently formidable and desperate cases is worthy of record.

CASE CCLIV. — *Ligature of the Left Subclavian Artery for Subclavian Aneurism, with a Remarkable Deviation of the Vessel, and Consequent Change of its Relations.* — The great mortality attending the ligature of the larger arterial trunks, and of the subclavian in particular, gives importance to any operation on those vessels. In the latter the danger is increased by its deep situation, — causing, in many cases, a great difficulty of reaching it, — and by the importance of the organs in its immediate neighborhood. According to the valuable tables furnished by Dr. Norris, out of 69 cases of ligature of the subclavian artery, 36 recovered, and 33 died, or nearly one-half. In operations on the iliac arteries, out of 118 cases, 85 recovered, and 33 died. From 38 cases of operation on the carotid artery for aneurism, 22 recovered, and 16 died. In every instance where it has been necessary to place a ligature on the subclavian artery, on the tracheal side of the scaleni muscles, the result has been fatal.

The case which I propose to relate offers some peculiar points of interest, apart from the general one of the ligature of the vessel. Among the principal of these may be mentioned the fact of a ligature having been applied to the artery for an aneurismal tumor situated above the clavicle; being, so far as I am aware, the first case of this kind that has had a successful result, because the recorded aneurismal tumors in that situation have required the application of a ligature within the scaleni, and the termination, as stated above, has been unfavorable. *Secondly*, The anatomical peculiarities in the relations of the vessel, to which may be attributed the possibility of the ligature on the outside of the scaleni. *Thirdly*, The rapidity with which the collateral circulation was restored, the pulse having been felt at the wrist twenty-four hours after the operation. *Finally*, The length of time the ligature remained attached, *ninety-six days*, notwithstanding all safe means were made use of to detach it.

A lady, 30 years of age, of delicate constitution, had a con-

genital club-foot of the worst kind, and a double curvature of the spine. For the former of these she was treated, when young, by Dr. Brown, at his infirmary; and the foot, after the section of the tendons, followed by the appropriate treatment, was completely brought into its natural position, so that she was enabled to walk with ease, without the aid of any mechanical support. The curvature of the spine was submitted to a similar treatment, with the same successful result.

She consulted me in the early part of December, 1847, for an aneurismal tumor situated just above the scapular end of the clavicle, about the size of a pigeon's egg, of which she gave the following history:—

Four months before, while in attendance on a sick brother, she had occasion to draw the cork from a bottle, and felt a sudden crack over the clavicle. Her attention was not attracted to it at the moment; but, a short time afterwards, a small swelling, having a decided pulsation, was distinguished at that spot, which increased rapidly in size. It had a powerful pulsation, and possessed the usual thrill characteristic of an aneurismal affection.

I endeavored to discover the subclavian artery in its normal situation beneath the clavicle, at the point where it passes over the first rib. No large vessel, or any osseous protuberance answering to the tubercle of the first rib, usually taken as the guide to the artery in this position, could be found. Different parts of the neck were then explored, which led to the discovery of a large artery passing obliquely upwards, parallel to, and about an inch removed from, the external border of the trapezius muscle. Compression being made at this point, the pulsations of the tumor ceased, as well as the pulse at the wrist. There was no question, therefore, in my mind, that this was the subclavian artery; but it was more difficult to determine the cause of this remarkable anomaly.

I now sought for the first rib, and discovered both the first and a part of the second rib passing obliquely across the neck above the clavicle. The insertion of the scalenus anticus muscle into the first rib was at length distinguished: the tubercle, however, was not sufficiently developed to be manifest to the

touch. The whole osseous system of the chest, in this case, had undergone a partial displacement. The spine and ribs attached had been, as it were, moved upwards; while the sternum was carried in an opposite direction.

Making a strong compression on the vessel above the tumor, the arm became extremely painful, with a sensation of numbness; and, on a subsequent and more careful examination, the whole brachial plexus of nerves could be discriminated, in immediate contact with the artery.

As the tumor was rapidly increasing, it was evident, that, considering its situation and the great danger of delay, no time was to be lost, if any surgical operation was to be resorted to.

The patient, a person of much fortitude and strength of character, agreed at once to the course advised. The operation was performed on Dec. 24, 1847.

An incision about two inches long was made, extending from near the outer and upper edge of the sterno-mastoid muscle downwards, in the direction of the scapulo-clavicular articulation, and an inch from the edge of the trapezius muscle; the pulsations of the vessel being the principal guide, as the other anatomical marks were wanting. This incision divided the skin and superficial fascia; a second cut opened one of the branches of an artery given off from the thyroid axis, which was tied. A nervous band of some size was now encountered, and at its side, and directly over the artery, a large vein, apparently the external jugular. The vein was carried to the upper part of the wound, with a silver hook, and the nerve to the lower; the dragging upon the latter caused a disagreeable and somewhat painful sensation in the arm.

The sheath of the vessel was next opened, the cellular membrane around it cleared away, and the aneurism needle, unarmed, passed from below upwards, on account of the difficulty of introducing it in the opposite direction, from the interference of the scalenus anticus, which had its insertion just below. The needle at once encountered and raised the lower nerve of the brachial plexus, which was in the most intimate contact with the artery. By depressing the handle, and urging the point forwards with careful manipulation, the eye of the needle was

brought out between the two. The instrument was now threaded with the ligature, and withdrawn. Careful exploration was made to ascertain if any nerve was included; the painful sensations in the arm, caused by drawing the ligature downwards, at first leading to the supposition that this might be the case. But, when the same traction was made directly upwards, no pain was felt; the former sensations being produced by the dragging on the cervical portion of the brachial plexus, owing to their connection with the vessel.

The ligature was now tied, and the wound dressed. The pulsations in the aneurismal sac, as well as those of the radial artery at the wrist, at once ceased; and all appearance of tumor vanished. The patient's arm and hand were a little cold directly after the operation, but, being rolled in flannel, soon regained their natural temperature.

25th. Found her quite comfortable. She had passed a quiet night.

26th. She says that the pulse at the left wrist returned for a time last evening: it then disappeared, but returned again, though faintly, this morning. I could not discover it at the time of my visit.

27th. She has been somewhat troubled by occasional pains in the arm. The pulse was felt yesterday once or twice, being intermittent. The wound has healed by the first intention. She has suffered occasionally from palpitation of the heart.

29th. The pulse was perceived, though feebly, at the wrist, but could not be detected in the axilla. The spot formerly occupied by the aneurismal tumor now presents an obvious depression.

Jan. 2, 1848. — The pulse is constant at the wrist.

14th. The ligature still remains on the artery, notwithstanding the traction daily made by the patient, in accordance with my directions. A number of large vessels, taking their origin from the subclavian, exist in different parts of the neck. One of these, apparently the supra-scapular, passes directly over the sac, and pulsates so strongly as at first to convey the impression of a return of pulsation in the aneurismal tumor.

March 30th. Once or twice in the course of the last two or three weeks, finding that the ligature was not detached, I have seized it with the forceps, and, holding the artery forcibly down on the rib, have twisted the thread with considerable force. This was done for the third time yesterday, when the ligature separated, *ninety-six* days after the operation.

The wound almost at once closed.

I saw this patient on Sept. 14, 1848, for the last time. At that period she was quite well, had recovered the use of her arm, and was in no way incommoded by the operation to which she had submitted. The aneurismal tumor had in a great measure disappeared; but it still conveyed the impression of containing a fluid. Directly on its surface, and incorporated with it, was a very large arterial trunk; supposed, as above stated, to be the supra-scapular. This vessel pulsated powerfully, and at first gave an appearance of pulsation to the tumor, but, by careful manipulation, could be separated from it; the pulse at the wrist still remained a little less strong than in the corresponding artery of the other side.

CASE CCLV. — *Ligature of the Femoral Artery for Popliteal Aneurism. Cure.* — In September, 1853, I was requested by Dr. Josiah Bartlett, of Concord, to see a man, a blacksmith by trade, with an aneurism of the popliteal artery. Four or five months before, he had perceived a small pulsating tumor in the upper and back part of the left leg. This increased slowly to the size of a hen's egg. The knee was bent, and he was obliged to walk with a crutch. The foot was swollen, excessively painful, and its motions partially lost. The patient being informed of the dangers of the operation by ligature of the artery, the possibility of paralysis or sloughing of the limb, consequent upon it, and of the alternative of the treatment by compression, decided on the former, as he lived out of Boston, could not well leave his family, and it was impossible to have the compression satisfactorily conducted at home.

The femoral artery was therefore tied at the middle of the thigh, and the pulsation of the tumor at once arrested. The

patient, a very muscular man, was directed to be kept in bed, artificial warmth to be applied if necessary; and, in case of great re-action, blood to be taken from his arm. For a week or two after the operation, the numbness of the foot was much increased, though the pain was relieved. The ligature separated in sixteen days.

This patient was seen by me some months afterwards, when he was able to walk. A small, hard tumor still existed at the place of the former aneurism, having an apparent pulsation, which, however, after repeated examinations, proved to arise and be communicated from an enlarged collateral vessel. He was directed to keep still, avoid animal food, and to do nothing that might excite the arterial action.

By subsequent reports, he was quite well.

CASE CCLVI. — *Large Aneurism of the Thoracic Aorta, with Perforation of the Sternum. Death.* — A gentleman, 66 years old, was attacked in 1862 or 1863, with dyspnœa, attended with considerable congestion about the face, coming on suddenly, after mental emotion caused by the death of a friend. Being examined by his physician, strong pulsations were perceived in the neighborhood of the sternum; and a pulsating tumor, with aneurismal thrill, was detected at about the middle of that bone. At this time, I saw him in consultation.

The patient was of plethoric habit, had been generally healthy, but led a laborious life, being connected with a printing office, and up late at night. Some years before, he had had a rheumatic attack in his shoulders, lasting three months. I advised quiet, a vegetable diet, and great care as to exercise and excitement, until the course of the disease was fully developed. Under this treatment, the thoracic symptoms were relieved, but the tumor gradually increased; and he finally came under my care, with severe attacks of hemorrhage from the nose, which required surgical interference.

In November, 1865, after having thus passed two or three years in comparative comfort by means of great care, he was suddenly taken, while absent from home, with faintness and insensibility, and was carried to his house. On seeing him, I

found the right side of the body paralyzed. His face was not red, as in apoplexy, but of a livid paleness. He gradually recovered his senses; and, by the following morning, his mind was fully restored. The attack was supposed to be caused by the escape of a coagula from the tumor, lodging in and obstructing the vessels supplying one portion of the brain, and temporarily suspending its functions. The paralysis of the leg and arm, which had been complete, gradually disappeared; so that, at the end of five or six weeks, nothing but a slight stiffness remained. At this time, the tumor on the sternum occupied nearly its entire breadth: it was thirteen inches in circumference, and had an elevation of between three and four inches. The parietes appeared bony for about half this distance; though, on examination after death, this proved to have been deceptive; being above excessively thin, and apparently composed simply of the skin and the aneurismal sac. A slight ecchymosis had taken place on the surface. Pulsations in it were very active and powerful.

Some change in the aneurismal tumor had produced an affection of the air-passages, so as, at times, almost to threaten suffocation. These symptoms, however, gradually subsided; so that, at the end of a couple of months, the patient was in a comparatively comfortable state, able to walk about his room, and to take a moderate amount of food.

On the 15th of January, 1866, early in the morning, at about four o'clock, he complained of a sudden pain in his right elbow, shoulder, and side of head, and almost immediately expired.

On examination of the body the next day, the following were the appearances presented:—

The sternal tumor had shrunk but little. In the left side of the chest, there was a quantity of bloody serum: in the anterior mediastinum was a large coagulum, enough to fill a quart measure. The pericardium was firmly adherent to the heart and parietes of the tumor. Through it, by a small rent half an inch in length, the blood had escaped.

Neither the trachea, œsophagus, nor bones on the back part of the chest, appeared to be interfered with by the tumor; the

irritation of the laryngeal nerve probably having a part in the laryngeal symptoms which were occasionally manifested.

The aneurismal sac was as large as the two fists, and closely and extensively adherent to the anterior parietes. It arose from the ascending aorta towards the left side; and the opening, which was of an oval form and remarkably defined, commenced one and a half inches above the aortic valves, and reached to within the same distance of the *arteria innominata*. It was evidently a false aneurism, and the cavity was nearly filled with soft fibrin and grumous coagula.

There were also two other small aneurismal sacs, quite distinct from the above. One was an inch from the aortic valves, and formed a very defined, rounded tumor upon the right side of the artery, of a dark-red color, firm to the feel from its being filled with coagula, and in size about equal to a nutmeg; the other, arising from near the origin of the *arteria innominata*, was in every respect similar, except that it was more than twice as large. The orifice of each of these little sacs was of an oval form, quite small, and so defined as almost to look as if a piece had been punched out.

The aorta, as far as where it was cut off towards the diaphragm, was quite diseased, with considerable cretaceous deposit. The ascending portion was very much dilated, and measured transversely about seven inches, without including the opening of the large sac. From the arch downwards, it was about the natural size. Upon the right side of the ascending portion, and commencing two inches above the valves, was a "true" aneurism, the cavity of which was shallow, but sufficiently defined, and measured one and a half inches in diameter. This, of course, was not included in the above measurement. There was also a defined dilatation of the *arteria innominata*, at its origin and in its whole circumference, extending upwards about three-fourths of an inch.

The heart was healthy, with the exception of the adhesions mentioned above. The upper vena cava was completely obliterated within an inch of its opening into the auricle, and to the extent of three-fourths of an inch; nothing being seen of the vena azygos.

The sternum was entirely destroyed from just below the cartilage of the second rib to opposite that of the fifth; and, the coagula having been removed, the ragged ends of the cartilages were distinctly felt within the sac.

CASE CCLVII. — *Enormous Aneurism of the Abdominal Aorta. Death. Autopsy.* — I was first called to the patient, a gentleman 43 years old, in 1840. He was afflicted with severe neuralgic pain in the left hypochondriac region, extending in different directions to the bladder, kidneys, and also downwards to the integuments of the left thigh, where it was almost insupportable. At that time, no tumor could be discovered in the abdomen. The suffering, in spite of all remedies, became so severe, that the patient, in order to get any relief, was obliged to place himself on his hands and knees; and, thus situated, with his head downwards, he was able to get some rest in the course of the twenty-four hours. This position was maintained, for the greater portion of the time, for six weeks. At the end of that period, he was seized with a violent hemorrhage from the nose, which was only checked, at the end of twenty-four hours, by plugging the nostrils. Subsequent to the hemorrhage, the pains became somewhat relieved; and he was able to resume the recumbent position. An examination of the abdomen being now possible, a pulsating tumor could be discovered in the left hypochondriac region, having on its front part what appeared to be the kidney.

From that period till 1842, the tumor gradually increased in size, extending in either direction, upwards towards the thorax, and downwards towards the thigh. The pulsations were usually so strong as to shake the whole body, and were much increased before an occurrence of hemorrhage from the nose, which, from 1840 to 1842, occurred at pretty regular intervals of two or three months, and was always checked with great difficulty, but was attended with relief to the system. The digestive functions were pretty regularly performed. He was obliged to take his food while in a recumbent position; otherwise the tumor seemed to press upon the stomach, and destroy the appetite. As the tumor encroached on the thigh, the limb

gradually became more and more flexed, until it was drawn up so as to form a right angle with the body.

July 11, 1842, he was again seized with a return of hemorrhage from the nose, which, though checked from time to time, again returned so as gradually to exhaust him. The nostrils were plugged both behind and before: the blood, however, was in such a fluid state that it still continued to find an exit through the puncta lachrymalia.

The patient retained his faculties perfectly to the last; and, through the whole of this long and trying period, bore his sufferings with the most heroic fortitude.

The treatment consisted principally in small bleedings, when the system from time to time became plethoric, and intimations were given of a recurrence of the hemorrhage. By these means, the epistaxis was occasionally warded off. The patient himself was always well aware when this became necessary.

The following appearances were presented at the post-mortem examination: On turning back the abdominal parietes, all the organs of the left side were found to be raised up on the surface of an enormous tumor. The left kidney occupied the epigastric region, and was the most prominent organ.

The tumor had pushed up the diaphragm, so as to be, at its apex, on a level with the fourth or fifth rib; below, it had passed down on the surface of the psoas and iliac muscles, underneath the crural arch, and descended nearly to the middle of the thigh. On removal from its situation, it was found to commence in the abdominal aorta, opposite to the origin of the cœliac axis. The superior parietes of the artery appeared intact; below, at the point of origin of the tumor, they were deficient for the space of two inches.

The parietes of the tumor were formed beneath by the ribs, the muscles, and the integuments of the posterior part of the abdomen; above, the usual appearance presented by an aneurismal sac. The bodies of the lower dorsal, and three superior lumbar vertebræ, were nearly destroyed; also a portion of the body and crista of the ilium of the left side. One large coagulum appeared in the sac. The blood was in a very fluid state, so that nearly all which remained in the body seemed to escape with the

first incisions. The tumor was nineteen inches in length, and eighteen in circumference; being, I believe, one of the largest on record.

CASE CCLVIII. — *Wound of the Carotid Artery. Ligature twice repeated. Death from Hemorrhage from the Recurrent Circulation.* — Early in the spring of 1848, while a young man, 18 years old, was walking in the street, a person stabbed him from behind in the neck. The wound bled freely at the time, and again on the two subsequent days; the bleeding each time being arrested by exposure to the air, and compression. The cartilage of the left ear was divided; and the weapon had penetrated the neck behind the angle of the lower jaw, and about half an inch behind and below the left ear, in a direction downwards, inwards, and forwards. When I saw him, a week after, he was very pale, and somewhat emaciated; his pulse was quick and jerking; there was slight paralysis of the left side of the face. I tied the left common carotid in the usual manner. From the seventh to the ninth day, repeated hemorrhages occurred, each time being checked by compression. On the ninth day, the wound was opened, and cleaned out; when it was found that the blood came from the carotid artery, where the ligature had been applied. On consultation, the artery was again tied below the former place. Two days after this, the blood began to flow from the upper part of the wound, apparently coming from the spot where the first ligature was applied, and from the recurrent circulation. Pressure arrested the flow of blood, which recurred, however, in the course of the day. Coma supervened in the course of three days; respiration gradually became more feeble; and, on the thirteenth day after the first operation, he expired.

At the autopsy, it was found that the wound in the neck was irregularly triangular, situated as mentioned above, and penetrated beyond the carotid. The lower jaw was sawn through, and the left side disarticulated. The wound was then followed: it divided the mastoid process of the temporal bone, nearly parallel with the base of the skull; a portion about half an inch thick being separated. It then passed inward, upward, and for-

ward, in front of the styloid process of the temporal bone and the internal carotid artery to the depth of about two and a half inches, in the direction of the anterior portion of the base of the brain; and stopped very near, if not in contact with, the skull, close to the inner extremity of the petrous portion of the temporal bone. About two inches from the commencement of the wound, a cavity nearly as large as an almond had been formed by the force of the blood issuing from an artery, the open mouth of which was found just beyond. The whole of the left side of the neck was much swollen. There were no healthy granulations in the wound made for the purpose of tying the carotid. The ends of that vessel, where it had been divided by the first ligature, were separated about half an inch. The second ligature still surrounded the artery, which was filled below with coagula of little density.

The whole of the brain was pale, bloodless, and very soft. A layer of lymph covered its base, extending from the middle of the fissure of Sylvius on one side to a corresponding point on the other, and from the middle of the anterior lobes, backwards and downwards nearly to the foramen magnum.

The heart was contracted, nearly empty, and its muscular substance loose and flabby.

The left lung was adherent to the costal pleura by strong adhesions. The organs generally presented a bloodless appearance.

CASE CCLIX. — *Wound of Superficial Palmar Arch. Ligature twice supplied.* — March 31, 1861. A woman, 18 years of age, received a wound in the palm of the hand by thrusting it through a pane of glass while trying to prevent a window from falling. There was a good deal of bleeding at the time, but it was arrested by compression. April 1st, there was a return of the hemorrhage; and she bled, according to the account of her friends, "two quarts." She was then brought to the Hospital. On her entrance, she was very weak, and faint. There was a pulsating tumor in the palm of the hand, with a small wound over it. Compression of the radial artery had no effect upon it; but the pulsations were at once arrested by

compressing the ulnar artery. It was decided to secure the artery in the wound. She was etherized; and, the wound being enlarged, the superficial palmar arch was exposed, and the source of the bleeding at once discovered. The artery was tied, and the wound closed. She was ordered beef-tea, and brandy and water. On the following day, the 2d, there was an oozing of blood from the wound; and compression was applied.

On the 4th, quite a hemorrhage occurred; and, on sponging the wound, the ligature applied before became loose, and came away. The wound was opened, and the same vessel tied. She was discharged on the 23d, well. The second bleeding in this case, in all probability, was occasioned by the arch having been raised up, and the ligature applied to the loop; the force of the circulation gradually pressing the ligature off. At the time, it seemed to have been tied with ordinary force. On a second application in the same way, the result was successful.

In recent cases of this kind, it is best to search for the vessel, and tie it, if possible, in the wound; otherwise, try pressure. If this fails, tie the brachial artery, although this is not always certain; as, in one instance I have seen, the hemorrhage recurred after this vessel was supposed to be tied, on account of its division higher up.

VASCULAR OR ERECTILE TUMOR.

This disease has been admirably described and depicted by John Bell, who named it aneurism by anastomosis. The name, erectile tumor, is given to it on account of the striking analogy which it presents in structure with the erectile tissue found in certain parts of the body in man, and in most of the higher animals. Erectile tumors are made up almost wholly of greatly enlarged bloodvessels; and are divided into arterial and venous, according as one or the other class of vessels seems to predominate. The arterial tumors, which are altogether the most formidable, are often of very rapid growth, and are marked by active pulsation. The venous tumors are more indolent, and often impart to the touch the feeling of a fatty growth: they may, however, be partially emptied of blood by pressure,

and thus temporarily reduced in size. It is a common characteristic of erectile growths, that they become enlarged and turgid during any act which obstructs the free return of the blood to the heart, — such as coughing, crying, laughing, &c. ; contracting again to their former size when the patient becomes quiet.

The treatment of small erectile tumors — *nævi materni*, for instance, — is very simple, and may be either by excision or by the ligature. In excising them, the absolute rule is that laid down by John Bell, — “not to cut into them, but to cut them out.” In operating by the ligature, it is essential that the whole growth should be thoroughly strangulated. If, in the attempt to excise the tumor, it is unfortunately cut, the whole growth should be immediately included in a ligature, and allowed to come away by sloughing. I have several times treated erectile tumors of the face by repeated small cauterizations with nitric acid, and have thus succeeded in destroying the whole morbid tissue piecemeal, without the loss of substance and consequent scar which follows excision or the ligature. Injection of the growth with perchloride of iron has also been employed, in many cases with success ; but death has occasionally resulted from the practice.

The operation for the cure of extensive disease of this kind is one of the most formidable in surgery, owing to the liability to dangerous or even fatal hemorrhage. In two cases, where large pulsating tumors occupied nearly the whole forehead and upper part of the head, I have succeeded in destroying them by a series of operations, in which the afferent vessels were obliterated by strong ligatures tied over pins passed beneath them, and thus the whole circumference of the growth thoroughly strangulated. By the application of new ligatures as often as any return of the pulsation was detected, and by the free use of styptics and escharotics, the disease was finally extirpated. In another case, I tied both the carotid arteries for an immense erectile growth, which occupied the lower lip and a large part of the face and neck. The result of this operation, which was then only the third or fourth in which both the carotid arteries had been successfully tied, was perfectly satisfactory. A part of the

lower lip, which had been the seat of an ulcerated and a bleeding tumor, was afterwards excised without troublesome hemorrhage; and, on seeing the patient two years subsequently, the vascular tissue was found to have wholly disappeared. In a pulsating tumor of this character, occupying the palm of the hand, and held, as it were, like a ball in its grasp, the tumor gradually increased, and finally involved nearly the whole upper extremity. The limb was amputated near the shoulder, in time to save the life of the patient; although the erectile tissue had partially invaded the structure of the part, and many ligatures were required to arrest the bleeding. The specimen, which shows a direct continuity of the largely dilated arteries with the venous trunks, was beautifully injected and prepared by Dr. R. M. Hodges. I have also had under my care a girl, nineteen years of age, with a large venous erectile tumor, occupying nearly half the cavity of the mouth, and hanging down from the lower lip. It also included a large portion of the tongue, and at times seriously affected deglutition and respiration. This case was operated on by the ligature, tying both the tumor of the cheek and that of the tongue on the same day. The ligatures came away at the proper time, and the result was fully successful.

I have spoken thus at length of this disease, on account of its rarity, and from the fact, that, owing to the absence of pain, it is too often neglected until it has acquired enormous proportions. In such cases, it is rarely to be cured by a single operation; but requires a patient and persevering use of needles, ligatures, caustics, and sometimes, although very rarely, the knife, before it can be completely extirpated.

CASE CCLX.—*Formidable Case of "Aneurism by Anastomosis" of the Scalp. Operation by Ligature. Cure.*—A healthy young man, 19 years old, entered the Hospital on the fifteenth day of April, 1861, for the treatment of a tumor of the scalp, which had begun to grow with great rapidity.

About five years before, it was noticed that the bloodvessels under the skin of the forehead were becoming enlarged; but it was only for about a year that a decided tumor had existed.

The tumor was situated in the median line, and measured in its longest diameter about three inches, and in its smallest nearly two; its elevation being about two inches above the frontal bone. Its shape was irregular; its bulk, about that of half a large orange; its appearance, that of a large mass of earthworms enclosed in a sack. It was of a reddish color, soft and compressible, and had a pulsation synchronous with that at the wrist. It was supplied by a great number of large, tortuous vessels, which pulsated strongly. The temporal and frontal arteries in front, and the occipital artery behind, seemed to afford the chief supply of blood to the tumor. The frontal arteries were especially enlarged, being quite equal in size to the radial artery. The patient had tried compression for six weeks, without diminishing the size of the tumor or the pulsation in it. All the vessels in the neighborhood of the tumor were greatly enlarged, and the whole surrounding tissue had that aneurismal thrill which belongs to affections of this description. It seemed to be spreading gradually, and involving the whole thickness of the scalp on the top of the head. The attack of it, therefore, by ligature of the large vessels, appeared to be at first of somewhat uncertain promise.

Operation. — On the 17th of April (the patient being etherized), by means of curved needles a strong ligature was introduced under each large vessel supplying the tumor, and at as great a distance as possible from the erectile tissue composing it. The ligatures were tied as tightly as possible, including the skin. The effect of this was to diminish the pulsation in the tumor, but not entirely to check it. Inside this circle, three needles were therefore introduced under the skin, each about three inches long, so as to include all the tissue around the tumor. Ligatures were introduced beneath these needles, and firmly tied. This served to cut off the circulation between the tumor and the surrounding tissues. There still remained a sensation of vascular motion in the substance of the tumor. Two strong ligatures were therefore passed through the base of this last circle, and were brought over the summit of the tumor, and firmly tied. The operation occupied about an hour and a quarter. In the evening, the patient was quiet, and slept a good

part of the time : his pulse was 70. On the 18th, he had some headache, and was much inclined to sleep ; skin hot, pulse 82. There was no pulsation in the tumor, and small vesications were appearing on its surface. On the 19th, he was comfortable ; pulse, skin, and tongue natural ; bowels had moved without medicine ; appetite fair, and no unpleasant symptoms. On the 23d, patient had remained comfortable since last report ; was sitting up in bed. There was a slight serous discharge by the side of the needles. On the 24th, there was a swelling of the right parotid gland, and a glossy appearance of the tissues between it and the tumor. Water-dressings were applied over the whole surface. On the 27th, a ligature and a needle were removed. 29th. It was found that a part of the tumor included between the ligatures was still alive ; but no pulsation could be detected in it. On the 2d of May, I removed all the sutures and a portion of the slough, which was partially detached. On the 11th of May, the patient was again etherized, and two large needles passed, at right angles to each other, under the base of that portion of the tumor which remained alive. A large and strong ligature was then passed under them, and tied with great force. On the 15th of May, the patient having gone on well, and the tumor being quite loose, the needles were withdrawn. A thick silk ligature was passed around the base of the tumor, and tied with a jerk, cutting off its remaining attachments, and completely separating all the diseased tissue. This was followed by quite free bleeding, requiring the application of ligatures to one or two large arteries. The bleeding which occurred from the small vessels was checked by the use of a solution of perchloride of iron. On the 25th of May, the eschar formed by the last application separated, leaving a healthy granulating surface. This healed kindly. Some weeks later, there being a suspicion of a slight erectile tissue remaining in a portion of the skin, I excised it, which finished the cure.

This case is interesting, first, from the large size of the erectile tumor ; secondly, from the great calibre of the principal vessels which supplied it ; and, thirdly, from the immunity from unhealthy action in the skin, notwithstanding the great amount of that tissue implicated in the ligatures. The parotid gland, at

one time, was certainly irritated, and the straining of the whole scalp caused a certain amount of swelling and an approach to œdema; but there was never any thing like erythema, and but little constitutional disturbance. There is but little doubt, that, if the tumor had gone on much longer unchecked, the vascular system of the scalp would have become so implicated as to make any attempt to relieve the patient by operation unavailing.

CASE CCLXI.—*Ligature of both Carotid Arteries for a remarkable Erectile Tumor of the Mouth, Face, and Neck.*—A young man, 23 years of age, consulted me on Oct. 1, 1845, for an enormous tumor of the lower lip and tongue, which had supervened on a birth-mark occupying a good part of the face and neck, and presented the following appearances:—

The head of the patient was larger than common: the left side of the face was almost wholly occupied by a discoloration, which was originally less extensive and lighter colored, but had attained the extent and appearance above mentioned. The right side presented a discoloration about half the extent of the left. The lower lip was much enlarged, everted, and gave three aspects: externally, the thick tumefied lip; internally, a fungoid tumor, covered by red granulations distended by blood, as if ready to break through; the whole surmounted by an irregular ulceration with thickened edges and a hardened base. The red granular appearance extended underneath the tongue to the inferior surface, the left half of which was enlarged to double its natural size and partially protruded between the teeth; its upper portion being the seat of five or six small ulcerations. The discoloration of the face also extended on the outside of the lip downwards over the chin and neck, covering a space of seven or eight inches in diameter; the whole, especially that on the face, being rather more full and distended with blood than natural. (See Plate III.)

The history of the case was this: The mark, as above stated, was congenital. About 1841 the lip and tongue began gradually to swell, and the former very shortly ulcerated. The ulceration occasionally healed, until the last year, when the



J. H. Burdette, 12th, Boston, Mass.



enlargement became permanent. By compression, the blood could be entirely expelled from the lip, and in the same manner from the tongue. Since the erectile tissue had been developed in the lip, the discoloration of the face had become more marked, had extended, and evidently partook of the character of the erectile tumor in its neighborhood.

This case was a very critical one; and the two most prominent dangers which threatened him were these: First, a possible degeneration of the ulcerated lip; and, secondly, alarming hemorrhage, which was likely sooner or later to take place, and which must, in all probability, prove rapidly fatal.

The following is the course I proposed to him: First, to have the left carotid artery tied; Second, after a considerable interval of time to tie the right carotid; Third, to attack whatever portion of the tumor remained by means calculated to produce contraction of the vessels and obliteration of the erectile tissue.

To this course, after weighing well all the dangers connected with it, the patient agreed; and, on Oct. 5th, I tied the left carotid artery. He recovered from the operation, and was out in about ten days. At that time the face had become more pale, the erectile tissue and the large tumor of the lip much diminished in size, and the painful ulceration which surmounted it was rapidly healing. He seemed to be in perfect health. I advised him to go home, remain three or four weeks, and then return to have the other carotid tied.

He returned Nov. 7th, when the tumor of the lip was found to have diminished one-half. The fulness of the face and neck was less, and the discolored parts were much paler than when he left. The size of the tongue was less, and the ulcerated spots on it had quite healed. His health remained good. It was determined, therefore, to proceed at once to the ligature of the carotid of the right side.

The patient being placed in a sitting posture, the carotid artery was laid bare, and a ligature passed under it. It was dilated about one-third more than its natural size. He was then placed on his bed, with the head slightly elevated: the pulse was found to be 80 in the minute. The ligature was

drawn tight. At first he exhibited no change ; but, shortly after, the pulse appeared to labor, and became slightly irregular : the only symptom noticed in the patient was that he became drowsy. After waiting about fifteen minutes, the second knot was tied, and the wound dressed.

No inconvenience was experienced from this operation, farther than a slight faintness during the afternoon on attempting to raise his head. He was directed to keep perfectly quiet, and to maintain strictly the horizontal position.

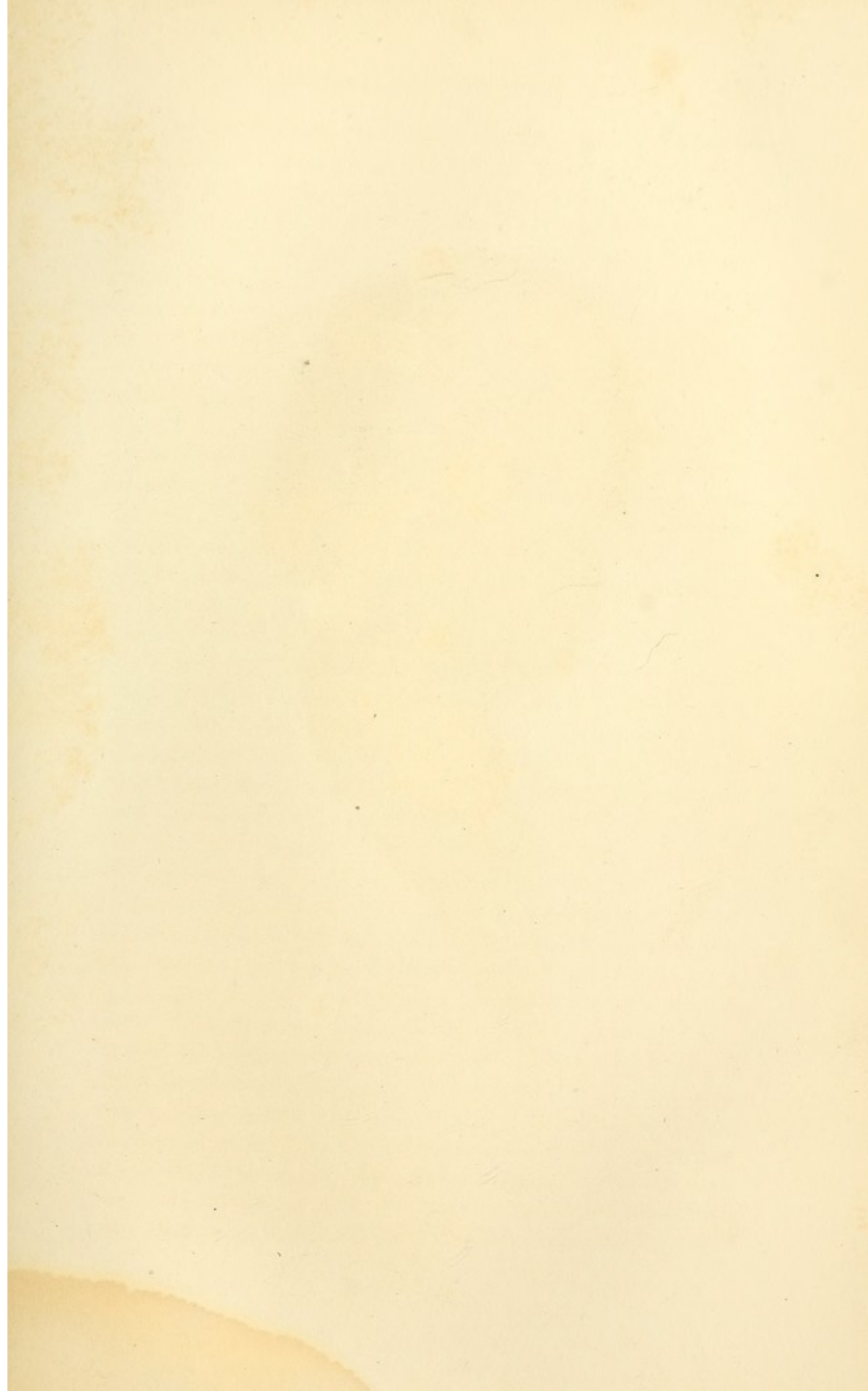
On the third day, there was a slight soreness about the larynx, which lasted three days. Nov. 19th, at the end of ten days, he was in good health, and able to go down stairs. The face was much paler than before the last operation, and the morbid appearances were diminishing.

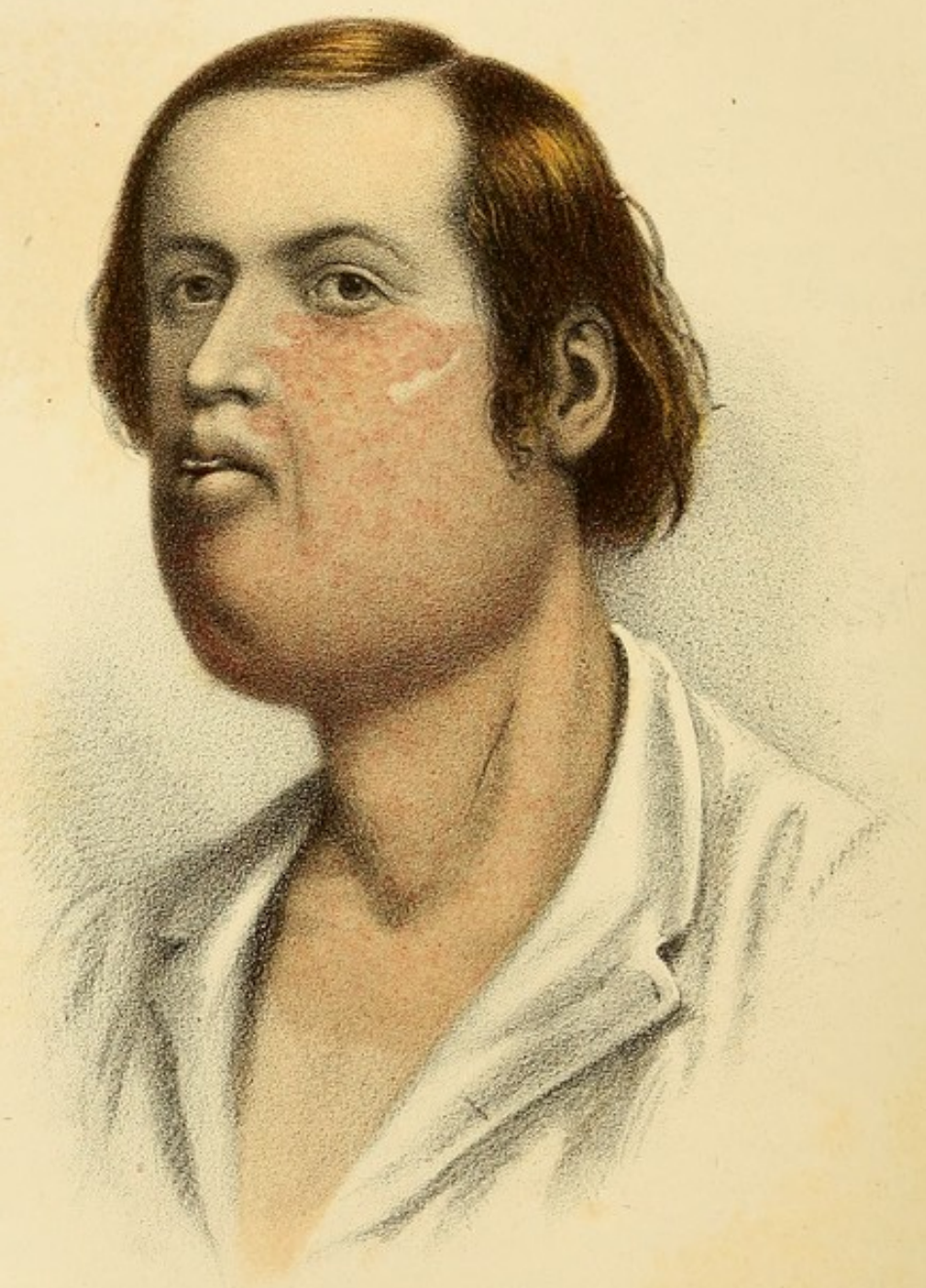
Nov. 26th. The ulceration of the lip was quite healed ; but the lip itself was still thick, and somewhat everted by the erectile tissue, which entered into its whole substance.

It was concluded, that, although the swelling was gradually diminishing, yet it would not wholly disappear without a further operation ; and that, as the patient lived at a considerable distance, the disease, if disposed to return, might get beyond control before the proper means could be applied to check its increase. I therefore determined to remove the diseased portion of the lower lip. Previously to this, and in order to avoid hemorrhage, I performed the following operations :—

A cataract needle was plunged into the vascular texture on the left side, and carried in different directions, so as to break up and destroy its organization. No hemorrhage followed this application. Three days afterwards, a similar operation was repeated on the right side.

Nov. 29th. A final operation was performed. A strong compression being exercised, by means of two steel forceps prepared for the purpose, on each side of the lip, so as completely to interrupt the course of blood into it, a portion not less than two inches in length at its free edge was removed by a triangular incision. At first there was not the slightest hemorrhage, the two lips of the wound remaining perfectly dry : on the compression being removed, however, blood gradually oozed from





J. H. Bufford. Lith. Boston, Mass.

the whole cut surface. This was easily checked, and the edges of the wound approximated by a number of points of the interrupted suture, and a powerful compressing bandage applied.

For the first twenty-four hours, he was carefully watched. Towards evening, a coagulum was found projecting from the wound, which was removed. From this time, there was no farther hemorrhage or bad symptom; and the wound healed by the first intention.

The portion of lip removed presented a spongy tissue, like the body of a leech, and gave a sensation in cutting like a piece of diseased lung: parts of it were indurated from the previous subcutaneous incisions. The muscular tissue had almost completely disappeared.

On Dec. 12th, the patient returned home quite well.

At this time, the drawing, Plate IV., was made. As will be seen, the discoloration of the face had become much paler, and that of the neck and chest had almost wholly disappeared. The ear had lost its swollen and deep-reddish color, and had become of a natural size and of a pale aspect.

No pulsation could be discovered in either of the temporal arteries, or, in fact, in any of the arteries of the head. In the neck, just above the clavicle, two large arteries, nearly the size of the carotids, were seen pulsating powerfully under the skin; being, in all probability, the supra-scapular arteries greatly enlarged.

Remarks.—It is now rather more than sixty years since Sir Astley Cooper first applied a ligature to the carotid artery for aneurism; and the operation at that time was looked upon with great distrust, from the fear of a fatal disturbance to the functions of the brain. It has since been frequently repeated, and with as good success as perhaps any of the greater operations in surgery. The object appears to be, that sufficient time should elapse between the ligature of the carotids to allow the collateral vessels which supply the brain to be dilated, so as to carry the quantity of blood required for the performance of its functions.

It seemed probable that hemorrhage would seal the patient's fate, or the morbid degeneration of tissue would hasten his death, unless some sure and active means were adopted to arrest

the disease. If the disease had been situated at a great distance from the vessels to be ligated, on the scalp for instance, there would have been a question, whether the supply of blood might not be kept up by a collateral supply through the vertebral arteries, by means of the ophthalmic. In the present case, no danger of this kind was likely to give cause for immediate apprehension, and the active part of the disease might easily be extirpated before the anastomosing vessels from other quarters had begun to supply the tumor, — an opinion supported by the event. The attempt to remove the lip without the ligature of the carotids would probably have been attended with fatal hemorrhage; and, even if the patient had escaped this accident, the diseased tissue in the neighborhood would have been an objection.

This patient I had an opportunity of seeing three years afterwards, and of making some observations on the state of the circulation in those parts about the face and neck supplied by the carotids. The situation of the temporal arteries being explored, no appearance of pulsation in them could be discovered. The same was found to be true in regard to the labial arteries. The angular arteries, where they inosculate with the nasal branch of the ophthalmic, gave the faintest pulsatory motion. In the region of the neck were a number of large vessels, having their origin from the subclavian; among which the supra-scapular was chiefly to be distinguished. The lip was rather more full in appearance than when the report of the case was made, but free from ulceration. The functions of the brain had not in any way been disturbed.

I have, however, twice attempted this operation in aneurism by anastomosis of the upper lip, where the disease has been partial. One of these cases is described in Dr. J. C. Warren's work on Tumors. The individual had a large red mark occupying nearly one-half of the left side of the face. During his childhood, the upper lip on that side had enlarged until it formed a permanent tumor, hanging down and obscuring the under lip: the gums had partaken of the disease; had become spongy, and, with the rest of the diseased mass, were bleeding on the least injury. Rather more than half of the upper lip was affected. I removed the whole of this by means of two incisions made in

the adjoining sound textures. A triangular piece being thus included, a number of dilated vessels, which supplied the erectile tissue, were tied; and the only hemorrhage which was troublesome arose from the angle of the wound, where the disease had extended up into the nostrils. The inflammation supervening on this operation was sufficient to obliterate the morbid tissue, which pervaded the mouth and its neighborhood. Three months afterwards, I saw almost exactly a similar case of disease (on the right side of the face), which was successfully treated in the same manner.

CASE CCLXII. — *Aneurism by Anastomosis successfully treated by Various Operations.* — The subject of this case was an inhabitant of Nova Scotia, a healthy man, 33 years old. He had on his forehead, principally below the roots of the hair, a little to the right of the median line, a soft, pulsating, irregular tumor, about three inches in diameter, and from a half to three-fourths of an inch in thickness, which gave him a very formidable aspect.

This tumor was of a reddish color, becoming redder and larger when the patient was excited, either by bodily exercise or mental disturbance. It appeared to consist of coils of vessels. It was easily compressed, and, on removal of the pressure, immediately enlarged again. A number of pulsating bloodvessels were seen to enter it from different directions, principally on the right side. Of these might be distinguished, first, the temporal artery, which was in a very enlarged and tortuous state as far down as the lower part of the external ear; second, a branch of the frontal artery; third, the facial or angular artery, from the internal commissure of the eyelids. On the left side were seen the left temporal artery, which was nearly as large as the right, and the left facial artery, which, with its fellow, the artery of the right side, and its accompanying veins, formed a vascular tumor at the root of the nose. The veins themselves were of an enormous size, passing down from the tumor on either side of the nose, covering and partially obscuring the internal commissure of the eyelids. Besides these vessels, the whole scalp in the neighborhood of the tumor seemed alive with

smaller arterial trunks, which were seen pulsating in every direction.

On compressing the temporal arteries, pulsation in the tumor was much weakened; and when, in addition to these, the facial arteries were also compressed, pulsation ceased, and the tumor became flaccid.

This tumor began sixteen years before, without any known cause, by a small reddish spot on the right side of the forehead. There was an occasional throbbing of the carotid arteries, particularly that of the right side. The patient was also subject to distressing headaches, accompanied with increased action of the bloodvessels of the tumor and of the head generally. This vibratory action of the arterial system of the head, neck, and upper extremities, was quite remarkable. He was incapacitated by it from all active exertion, and was ready to undergo any operation that promised to relieve him.

The course of this tumor, if not arrested by surgical treatment, could be readily foreseen. The morbid action would gradually involve other vessels, until the whole scalp became filled with enlarged arteries. The vessels of the eyelids, of the face generally, and even of the interior of the mouth, were likely to be involved. The patient's condition would, in this way, become almost insupportable; and his life would perhaps be hazarded by the rupture of the tumor, which seemed almost ready to take place.

What means should be adopted to arrest its progress? Those which naturally presented themselves in the first place were of two descriptions: First, ligature of the carotid artery. But, in this case, the ligature of a single carotid might not suffice to arrest the flow of blood into the tumor; since the vessels which supplied it, although principally from the right, were partly from the left carotid. The ligature of both carotids would therefore be necessary: but the result was less likely to be successful than in the preceding case, on account of the greater distance of the tumor from the arteries tied, and from the probability of its having other means of supply through the vertebral arteries, which inosculate freely with the branches of the internal carotid; the ophthalmic in this case being unusually dilated. The second

mode of operating which suggested itself was to expose the different vessels supplying the tumor, and pass a ligature under them. The objection to this course was the length of time an operation upon so many vessels would require. Were there any means that could be devised other than these two? The tumor was much too large to admit the safe and effectual application of caustic. It could not be cut out without dangerous hemorrhage. It was too large, and too much connected with the bone, to admit the application of ligature *en masse*.

Oct. 31, 1845. Having compressed, on the right side, the frontal and the two temporo-parietal arteries, and on the left side the continuation of the temporal artery through the frontal region, and the temporo-parietal, the pulsations of the tumor appeared to be arrested; and its contents were readily expelled through the large veins, running into the facial vein. It was determined, therefore, to interrupt the circulation through the five vessels first mentioned; three on the right side, and two on the left. Instead of exposing and taking up these vessels in the usual way, they were compressed by a ligature, thrown over the needles passed under them, in the form of a figure of 8. After this, the pulsation of the tumor was much diminished. Venesection was then performed, and the patient placed in bed with his head elevated.

Nov. 6th. The needles were removed. Very slight soreness had been experienced from them. The tumor was diminishing in size; the vessels constituting it appeared more flaccid and compressible. The soreness and all the uncomfortable sensations connected with it were lessened.

12th. The pulsations in the right and left temporal arteries still continuing, a needle was passed under each of these, directly above the ear; after which the pulsation subsided, and also the general sense of beating about the head. The patient was much more comfortable.

21st. In consequence of a slight bleeding from the wound of a pin inserted on the 16th, it was thought best to obstruct the vessels on the anterior and on the internal part of the tumor; and pins were passed in each of these situations. There was then no pulsation in the tumor; the tenderness existing on the

upper part before any operation had been increased. He had a chill from going into another room in the house, and after that some fever.

22d. At this date there was a sudden rupture of the tumor, attended with considerable hemorrhage. Being hastily called to the patient, I passed two large pins, at right angles with each other, under that part of the tumor from which the hemorrhage was taking place. A ligature was carried around under the needles, and, being tightened, the bleeding was effectually checked. It was to be feared, however, that, as the pins ulcerated out, the hemorrhage would recur. There being a want of accommodation in his lodging, and in order that he might be more carefully watched in case of a second rupture of the tumor, he was advised to go to the Hospital, where he came exclusively under the care of Dr. John C. Warren, to whom I am indebted for the remaining history of the case.

25th. "The pulse was now natural, 75; the internal sensations were much improved; there was no vibratory motion of the arteries of the head, and none were discoverable in the tumor, though a pulsation still existed. A slight œdema extended from the tumor to the nose and eyelids. Occasionally a drop of blood started from the needle wounds. From time to time, leeches have been applied with great relief.

30th. "On this day, a vessel was discovered running from the left frontal artery across the left eyebrow, communicating with a branch in the angle of the eye on the right side, thence running up along the left edge of the tumor, till it reached its superior posterior border. It did not produce a pulsation in this part of the tumor; but skirting along its edge for some distance, as it did, there was a strong probability of its sending vessels into the mass, thus tending to keep up the morbid action. The needles which were inserted on the 22d inst. caused an inflammation and induration of the tissue in their neighborhood, and were removed without hemorrhage.

"As compression of the artery rising on the forehead checked the specified pulsation, it was determined to tie this vessel. A needle was accordingly passed under it on Dec. 1st. Before placing the ligature, the vessel was compressed on the needle,

without interrupting the pulsation along the edge of the tumor. Another needle was therefore passed under that part of the artery where it penetrated at the superior internal angle of the tumor, embracing, over the needle, a vascular substance at least half an inch wide. A ligature, passed in the figure of 8 over this needle, suspended all pulsation. The patient had some pain, which lasted a couple of hours; after which he became easy.

Dec. 3d. "Two needles had separated from the substance of the tumor without hemorrhage. Besides the needle passed on Dec. 1st, there still remained one needle at the lower part of the tumor, which was passed under an artery from the right frontal. The tumor, which had been hard from inflammation, was softened; its heat, except near the needle passed the last time, had subsided. There was no throbbing in any of the arteries about the head: the carotid beat naturally. The patient was tranquil, felt well, and sat up, which he had not been able to do for some time on account of the throbbing in the head produced by any motion. He had a good appetite. His food was restricted, however, to half a pound of solid farinaceous matter per day, and about a pint and a half of liquid.

6th. "Although all pulsations were at an end, the tumor still existed, but in a diminished state. It was thought, that, if left to itself, it would in all probability disappear without further applications; but, as the patient lived at a great distance, it seemed to be a duty to see that the tumor was certainly and perfectly eradicated before he went home to Nova Scotia. The best mode of accomplishing this was by the application of caustic, which was resorted to without much danger of hemorrhage, the great vessels being cut off. The use of caustic was therefore commenced by the application of caustic potash, in a solid form, to the wound left by the separation of one of the needles. This wound was about one inch long and two lines wide. A little blood followed the application, which might have arisen from the pressure of the caustic; and therefore a portion of the same substance, in amount eight grains, was applied in powder.

16th. "The caustic had been applied three or four times.

Twice a slight hemorrhage had occurred, requiring an intermission in its use. A pulsatory movement having re-appeared in the relics of the tumor, the application of ice two or three times a day was directed, to be continued as long as the patient could bear it. To-day the caustic was re-applied to the ulcerated surface, which was about an inch long and half an inch wide. The tumor had sensibly diminished in size."

It will be unnecessary to proceed with all the subsequent details of this case. It is sufficient to state, that the different portions of the diseased mass which remained were successively attacked with caustic potash, and with the occasional application of croton oil. Any small arteries which were discovered running into the tumor were treated, as in the commencement of the case, by the needles.

On 5th April an operation was performed to excise a portion of the erectile tissue, which existed at the upper part of the wound, when a large vessel was opened and tied.

May 20th. After the wound from the incision and caustic was nearly healed, a fulness was perceived at its lower angle, immediately above the supra-orbital foramen. A triangular piece of the suspicious part was therefore cut out, and the supra-orbital artery tied. The whole wound, after this last operation, was nearly the size of a silver dollar. Strips of adhesive plaster were applied to approximate its edges. The wound came together with great rapidity. In a fortnight after the last incision, it was healed with a lunated cicatrix, and the parts appeared perfectly sound. The patient was in excellent health; and, May 20th, was discharged to return home.

Remarks. — In considering this case, the first circumstance which presents itself is its protracted and complicated treatment. The necessity of this arose from the obstinate character of the affection. The first operation was insufficient, and additional interference was required under the various appearances which occurred. Four different measures were successively adopted.

1. The large vessels were interrupted by needles passed under the arteries, and compression made on them by a thread in the form of a figure of 8.

2. The ligatures being insufficient to repress the action of the smaller vessels, caustic applications were resorted to for the purpose of destroying the morbid texture, and in part obliterating it by the inflammation produced by the action of the caustic. To this end, a very free application was made of caustic potash, and repeated between twenty and thirty times.

3. Excision of the remains of the vascular texture was performed, after the arteries supplying it had been so far obliterated as to remove the apprehension of hemorrhage.

4. Compression by adhesive plaster and a bandage had a sensible influence in finishing the cure.

The general treatment gave important aid to the local applications. The patient was kept very still, and for the greater part of the time in bed, with the head much elevated. His food was restricted to the smallest quantity, so that he was reduced for a time to a state of total prostration of the muscular power. During most of the treatment, if a small addition was made to his food, its effect was generally seen in the production of arterial vibrations and the recurrence of headache. Abstraction of blood and the use of purgatives were resorted to when necessary.

It is worthy of remark, that, while erysipelas prevailed all around this patient, he was never affected by it in the slightest degree during exposure of at least three months.

In conclusion, it may be said that this affection could only have been destroyed by a resolute and active perseverance in the various remedies, continued through all the turnings of the disease.

CASE CCLXIII. — *Remarkable Case of Aneurism by Anastomosis. Operation. Cure.* — A boy, 16 years old, partially froze the lobe of his left ear in 1818. This remained larger than the lobe of the right ear; and, in fact, slowly increased in size, finally forming a distinct tumor, red on its surface, and having a powerful pulsation. In 1852 it was found necessary to undertake some means to arrest its growth. For this purpose, compression between two plates of metal was advised and practised by his surgeon. Although this was done

in the most careful and scientific way, yet the suffering became so severe, that, after having persevered with it for a fortnight, it was found necessary to abandon its further application.

When the patient applied to me, it was with the full determination of having any operation done that might be thought expedient. The tumor had arrived at that condition wherein it was evident, that, if an operation should not be successful in removing it completely, it must soon pass beyond the reach of surgery, spreading over the ear and taking possession of the face, as in the case cited by Dupuytren in his "*Leçons Orales*," which resisted numerous and formidable operations, performed by some of the most distinguished surgeons in Paris.

The appearance of the tumor at this time was as follows: The lobe of the left ear was occupied by a globular tumor the size of a hen's egg. The surface was red, and covered by large veins running over it in all directions: the redness and swelling belonging to the tumor extended above, into the concha of the ear, and ran up for a short distance on its back part. In front, it slightly encroached on the cheek. On taking it in the hand, it had a powerful pulsating motion; not that alone presented by the common erectile tumor, but, added to this, what might be expected in an aneurism of a large artery, the carotid or subclavian for instance. By manipulation, vessels of considerable size could be perceived running into it from the ear and face.

At first, I was at a loss how to attack the disease, the danger of hemorrhage appearing to be great from any cutting operation; and, if ligatures were used, the same danger was to be apprehended on the separation of the threads. A combination of the two was finally resorted to.

The patient being etherized with chloric ether, the tumor was dragged upon, so as to stretch the integuments as much as possible. A pair of screw forceps, similar to an enterotome, was now made to embrace the whole base of the tumor, about three inches in length, that is to say, the whole enlarged lobe of the ear, with a portion of the cartilage. This was tightly screwed up, so as completely to interrupt the course of the blood into it. A needle, threaded with a strong double ligature, was next passed behind the forceps, and the needle cut off, leaving the two

threads. The tumor, now apparently effectually controlled, was cut away close to the forceps. It was, however, at once found, that, on the tension of the parts being relieved, that portion of it towards the cheek had escaped from the grasp of the forceps, and an artery was exposed nearly as large as the external carotid. This was seized by an assistant with toothed forceps, and a ligature applied to it. The grasp of the forceps being now slowly relaxed, it was observed that the whole cut surface was disposed to bleed. Some large vessels bled violently, and were tied. To stop the bleeding from the other parts, it was finally found necessary to apply the ligature *en masse*, which was done by means of two double ligatures. In the subsequent management of the case, all means were used to prevent too high a degree of inflammatory action about the ligatures. The patient was very carefully watched, kept quiet, a low diet enjoined, and a compress, constantly wet with cold water, applied. Once or twice, blood started by the side of the ligatures, but was restrained by refrigerant applications. At the end of fourteen days, the ligatures separated, leaving an exuberant granulating surface, upon which the nitrate of silver was freely used. On the twenty-third day, the wound was almost entirely healed, and the neighboring parts were in a perfectly healthy state; the effect of the inflammatory action having destroyed the enlarged capillary vessels which had extended into the concha of the ear, and invaded the integument on its posterior part.

In order to have extirpated all appearance of erectile tissue at the first operation, by the knife, it would have been necessary to sacrifice nearly half of the ear, and to leave the patient with a great deformity. In order to avoid this, I removed the tumor, trusting to the effect of inflammation to destroy the erectile tissue which remained.

The appearance of the tumor after removal was quite interesting. The main portion of it was composed of a spongy tissue, which enclosed an aneurismal cavity, apparently the expansion of the largest of the vessels described above, which were tied when the tumor was removed. From this cavity, branches extended in all directions, which finally could be traced into the cellular tissue covering the periphery of the mass.

CASE CCLXIV. — *Nævus over the Knee-joint.* — A young man entered the Hospital in June, 1852, with a nævus on the knee. The nævus was of a black color, situated over the inner part of the knee-joint, below the patella. Until within two years, the tumor had been about the size of a dollar; but, since then, a supplementary tumor had appeared underneath the original one, not soft, as is usually seen in these cases, but quite hard, and extending for some distance into the adjacent cellular membrane, and apparently attaching itself to the synovial capsule. The whole tumor had become extremely sensitive, so that even the contact of the clothes caused much suffering; and prevented him from attending to business. It was impossible to make any satisfactory examination, the patient dreaded so much the slightest manipulations. He was dieted, and kept in the horizontal position for a few days; an evaporating wash being externally applied. This had the effect of relieving the tenderness in a slight degree. The whole tumor was now congealed by means of a freezing mixture of pounded ice and salt, according to Mr. Arnott's process, which I had just commenced to experiment with. The hard basal tumor was then very freely cut up by a subcutaneous section. The operation was entirely painless, and no unpleasant symptoms ensued. The vicinity of the knee-joint of course precluded any operation for the excision of the tumor. The above subcutaneous section was, therefore, once or twice repeated; and resulted in the absorption of a large part of the tumor, and diminished the sensibility, so that it could be handled without suffering. He left the Hospital at his own request; otherwise, by a repetition of the above means, the complete destruction of the tumor would have been effected.

In another case, I removed a similar nævus, in an ulcerated state, situated on the upper part of the calf of the leg. The patient was twenty-six years of age. Two years before, the tumor had been injured, after which there was much hemorrhage. In spite of treatment, it had remained in an ulcerated state. The skin around it was much inflamed, and at times very painful. It was removed by two elliptical incisions, without much hemorrhage.

CASE CCLXV. — *Unusual Case of Varicose Aneurism of Palm of Hand and Arm. Amputation. Recovery.* — A girl, 19 years of age, of a delicate constitution, received an injury, when two years old, in the palm of her hand, from a stone; and, very shortly afterward, a small pulsating tumor appeared there. Twelve years afterward, she entered the Hospital. At that time, a large tumor occupied the whole hand, held as it were, in the palm. It was firm at some points, soft and pulsating at others; and seemed to have made its way backward, so as to give the idea of all the bones of the hand having been flattened, and forming a shell to it. On compressing the tumor, it had a powerful aneurismal thrill; and, in some parts of it, the blood seemed to be contained in large aneurismal sacs; at others, arteries of the size of the carotid could be detected. Amputation was advised as the only resource, but declined. A cast was made of the arm and hand at the time.

In addition to the tumor of the palm of the hand, there was also a supplementary tumor, quite firm to the touch, reaching up the whole fore-arm under the muscles, without pulsation.

In the spring of 1857, she came under my care again, the tumor having more than doubled in size, and the swelling on the fore-arm increased in a corresponding manner. At this time, a distinct aneurismal thrill attended the pulsation of the brachial artery; and the surrounding veins were in a highly varicose state. On auscultation, the tumor of the hand gave a sound like the noise of the machinery of a factory. The arm was quite unwieldy, and at times very painful; and the disease was rapidly increasing. The surgeons of the Hospital, in consultation, decided that amputation was the only means of relieving the patient, but considered that there was a possibility of meeting with erectile tissue in the arm. She was quite timid, and unwilling to encounter any more than the ordinary danger from an amputation. She therefore returned home; but, subsequently, the pain being so severe, and the tumor making advances, by the advice of her physician, Dr. Jones, she came to town, and submitted to the operation. In making the compression, it was deemed necessary to place a tourniquet quite high upon the arm, and screw it up so as to forcibly compress

all the tissues. Nearly twenty vessels, both arteries and veins, required ligature, as it was soon found that the veins carried arterial blood, and were disposed to bleed. The quantity of blood lost in the operation was small, on account of the very effectual way in which the compression was applied.

On the day after the operation, there was a great re-action; and this was so violent on the following day, that it was found necessary to take blood from her, which was done with relief. The whole stump, however, shortly became of a fiery red color; and a diffuse painful swelling appeared in the neck, above the clavicle. In a week or ten days, this subsided, but one morning it was observed that the breast had suddenly become puffed up; and, a day or two after, a great quantity of pus was discharged through an incision at this point.

After a very long convalescence, she went home nearly well. During the whole of the after-treatment, there was no hemorrhage from the stump, and no evidence of any erectile tissue remaining.

The arm was very beautifully injected by Dr. H. J. Bigelow, and a careful dissection made by Dr. R. M. Hodges. The wax injection was thrown into the veins, and returned by the brachial artery. The veins of the arm and hand were greatly dilated, and formed a beautiful basket-work around the bone: in the palm of the hand, they communicated freely with the arteries, which were dilated so as to form what might be called large sinuses. The solid part of the round tumor in the hand and fore-arm was formed of condensed and infiltrated cellular tissue.

The specimen, together with the cast, was presented by me to the Warren Museum.

I saw her a year afterwards, quite well, and wearing an artificial arm.

CASE CCLXVI. — *Venous Erectile Tumor of Mouth, Lip, and Tongue.* — A young woman, 19 years old, entered the Hospital, on the fourth day of April, 1864, for a congenital venous tumor, occupying the left side of the under lip, which hung down like a bag out of the mouth. The whole of the interior of the left cheek was pervaded by the tumor, as also

half of the left side of the tongue. There were traces of it on the velum palati. On the outside of the face, a bundle of veins could be seen running from the angle of the mouth, and a round mass passing up towards the ear, as if from the tumor within. The left under-jaw was excavated by the pressure of the tumor. She had been suffering with choking turns in the night, apparently from the obstruction caused by the enlarged tongue.

I decided to attack the disease by the ligature; and, if found necessary, to expose it by an incision made through the integument of the cheek, from the angle of the mouth.

On the 9th of April, the patient being etherized, the mass of the tumor of the cheek and lip was seized with hooked forceps, and drawn outwards from the mouth. Two needles, armed with stout ligatures, were then passed through the base of the tumor, at right angles; and the ligatures, being cut near the eye of the needles, were tied together, so as to embrace and strangulate the whole mass. The tongue was then seized with forceps, and drawn out of the mouth: a curved needle, armed with a stout ligature, was passed from above downwards through, in the median line, just behind the tumor, and returned from below upwards, half an inch nearer the tip. The ligature was divided, and the ends tied so as to include and strangulate the posterior portion of the tumor. The anterior portion was then strangulated in a similar manner. The bleeding was very slight.

The tongue swelled so as to fill the entire mouth; and the suffering was great, both from pain and the obstruction to breathing and deglutition. On the tenth day, the slough from the cheek and lip separated without hemorrhage, leaving an ulcerated surface; and, on the eleventh day, the slough from the tongue came away, with the exception of a portion included in the posterior ligature, which hung by a small pedicle. This pedicle was surrounded by a ligature, and the day after separated. She did well, and was discharged on the 6th of May.

On the 17th of September, she returned to the Hospital for the removal of the remaining portion of the nævus. During the summer, her health had greatly improved.

She was etherized, and the tumor seized from the inside of the mouth, with hooked forceps, drawn forward as far as possible, and a double ligature passed through its base. The ends were tied both ways, strangulating a large portion. She did well, the slough separating on the twelfth day; and, on the 7th of October, she was discharged, apparently entirely cured.

CHAPTER X.

INJURIES AND DISEASES OF NERVES.

INJURIES of the nerves belong more especially to military surgery, and have therefore, until very lately, been but little studied among us. The information given in the common hand-books is also quite meagre, and eminent authorities differ widely upon important points both of prognosis and treatment.

The immediate effects of the division or injury of a large nerve are the loss of sensation and of motion, and a diminished power of resisting changes of temperature, which would ordinarily cause no inconvenience. Severe pain is also a very common symptom, but is not always observed until the lapse of a certain time after the receipt of the injury. The loss of sensation and of motion may be either temporary or permanent, as might naturally be expected; but the connection between the precise nature of the injury and the subsequent phenomena has not often been marked out with so much exactness as could be desired.

The proposal of the plan of treating nervous affections by neurotomy involves the whole question of the repair of injured and divided nerves; a subject not very fully discussed in works on surgery, and therefore not very familiar to practical surgeons.

As regards the question of re-union of the two ends of a divided nerve, there is no doubt that such a result often occurs. A sufficient proof of this fact is seen in the restoration of nervous action in the trifacial nerve, even after the removal of a portion of one of its larger branches for facial neuralgia; also in the occasional reproduction of the nerves in the foot of the horse, when divided or partially excised, to conceal or relieve

certain forms of lameness. The same fact is also proved physiologically by the experiments of Cruikshank and Haighton upon the vagus of dogs; and anatomically by Meyer, Swan, Tiedemann, and others, who have actually traced the new nervous filaments in the cicatricial tissue, uniting the cut ends, and filling the void caused by the excision of a portion of several lines (and in one case nearly an inch) in length. Clinical observations bearing upon the same point are recorded by various authors. Mr. Syme, in his "Treatise on the Excision of Diseased Joints" (Case VIII., page 88), gives a remarkable case, in which the ulnar nerve was wholly divided at the elbow, in the operation of excision of that joint, and in which the functions of the nerve were perfectly restored in the course of a few weeks. A subsequent dissection of the arm, less than a year after the operation, revealed the fact that perfect union of the cut ends of the nerve had taken place, and that the nervous filaments could be traced from both ends into the intermediate new tissue, and apparently also from one end to the other. In a similar case, reported by M. Roux, a portion of the ulnar nerve was actually cut away: but, in the course of a year, sensation had entirely returned; and when the patient was examined, fourteen years after the operation, the sensation was as perfect as in the other arm. Mr. Paget also, in his valuable "Lectures on Surgical Pathology," gives cases of the return of the functions of the nerves after their division.

In view of these facts, it is important to inquire into the propriety of dividing the nerve as a remedy for traumatic neuralgia. In answer to this question, it may be stated, that, if the nerve is simply divided, sensation will probably return before the tissues implicated in the original injury have had time to recover their normal condition; and that therefore the operation will afford only very transient relief, and may have to be repeated several times. If, on the other hand, a portion of the nerve is excised, the restoration of the nervous function will be very much longer in taking place; but there will also be great danger that the repair will be incomplete, or even that it may fail altogether, and thus entail permanent loss both of sensation and of motion. The deliberate removal of a long section of the nerve, with a

view to the permanent abolition of its functions, can be but very rarely indicated, and then only as a last resort, as the possible alternative of amputation.

The rational treatment of these neuralgic affections seems to me to be based on the fact, that their natural tendency is to recovery, if only we can keep the patient comfortable, and thus induce him to wait for this tardy relief. This can only be effected by division of the nerve, or by the use, either local or general, of narcotics. The protracted use of opium internally, in sufficient quantity to relieve the pain, will almost inevitably exert a most pernicious influence on the health, while mere local applications to the skin seem to have very little effect. The great benefit which has been derived from the use of hypodermic injections of morphia for ordinary neuralgia naturally suggested the propriety of trying them in this affection; and the success which has attended the experiment has been most gratifying.

The following cases of severe traumatic neuralgia, which have occurred in my practice, serve to throw light upon certain points in the pathology and treatment of this painful affection. In all these cases, the injury seems to have been to the tissues surrounding a nervous trunk, rather than to the nerve itself; and the immediate cause of the painful affection which followed would seem to depend upon the effusion of inflammatory products within the dense fibrous neurilemma, thus entangling the nerve in a mass of cicatricial tissue, perhaps also compressing its fibres. The highly favorable result, in the first case, may be readily explained by the well-known law of development of new reparative material, by which it becomes gradually assimilated to the proper tissue of the part in which it is deposited. The dissection made in the course of the operation showed that the nerve was then firmly glued to the surrounding tissues; and its release from these connections was followed by perfect relief of the pain, which, however, returned in a diminished degree, as soon as the process of cicatrization had again commenced. The pain was then controlled during six months by the daily use of hypodermic injections of morphia; and, at the end of this somewhat protracted treatment, the neuralgic affection was found to have disappeared, and the nerve had so far recovered its normal

condition as to conduct ordinary sensations in a very satisfactory manner. The second and third cases are equally important, as showing the powerful effect of the narcotic injection; in the one case in relieving the pain, and in the other actually curing it.

CASE CCLXVII.—*Severe Neuralgic Affection following a Gunshot Injury of the Median Nerve. Subcutaneous Injection of Morphia. Operation. Injection continued for nine months. Recovery.*—In the second battle of Bull Run, Lieutenant A. was struck by a ball, on the outside of the middle of the arm. The ball passed obliquely through, traversing the biceps muscle, and coming out on the inside of the arm. For two or three days, he was exposed to the weather, lying under the piazza of a house, having but little food, and with his hand constantly wet with the rain which was falling. The hand was benumbed; but he suffered somewhat with a sensation of heat in it, which was partially relieved by keeping it exposed to the wet. There was no pain in the wound itself. Shortly after, he was removed to Washington, where he first experienced very severe pain in the whole hand, but more particularly in the part of it supplied by the median nerve. I saw him about a fortnight after the receipt of the injury. He was then in constant and severe pain in the hand; so much so, as to require to be kept more or less under the influence of morphia, which he was taking to the amount of a grain a day. On examining the point at which the wound was received, a puckered eschar was seen, with an induration extending deeply into the belly of the biceps muscle, to which the skin was adherent. The situation occupied by the vessels and nerves, on the inside of the biceps, was also enveloped in a mass of indurated tissue. The first idea suggested by this state of things was to cut down upon the nerve, and divide it. It seemed, however, possible, by the gradual change going on in the tissues, that a healthy action might ultimately be set up; and, at the same time, the indurated tissue surrounding and compressing the nerve might be absorbed, finally relieving the nerve from pressure. The question was, whether the sufferings of the patient could be sufficiently mitigated, by artificial means, to allow of the adoption of a temporizing course. He was ad-

vised to place the limb perfectly at rest, wear it inside his clothes, next the body, and to have a sleeve made of sheet India-rubber to envelop the lower part of the arm, which covering was to be removed from time to time, the arm exposed to the air, and washed with soap and water: he was directed to discontinue the use of the rubber sleeve if much irritation was set up in the skin, and to envelop the arm in flannel instead, which he had previously found necessary, owing to the great reduction of temperature. He went home, and followed this plan for three or four weeks. At the end of that period, he came to me again, with the desire of having the nerve divided; as his sufferings had become so intolerable, in spite of the use of opiates, as entirely to deprive him of rest. Before resorting to an operation on the nerve, I determined to try the effect of subcutaneous injections of morphia. Half a grain of sulphate of morphia, in solution, was injected deep under the skin of the fore-arm twice a day. He was at once placed in a state of comparative ease; and the evening injection gave him a good night's rest, such as he had not enjoyed for many weeks. This plan was followed up for a month, with equally good effects: his digestion was not in the least affected by the use of the morphia, and he gained considerably in flesh. If, however, the dose was omitted, the pain became as severe as ever. It was therefore decided to perform an operation. An incision of three inches in length was made over the inner edge of the biceps, and the integument dissected on both sides separating the cicatrices, caused by the entrance and exit of the ball from the subjacent tissues. The indurated mass which surrounded the vessels and nerves was now cut into; and the median nerve being discovered, where it entered, was gradually laid bare and dissected out, so that it lay perfectly loose in the wound for an inch and a half or two inches of its length. It was thought best not to divide the nerve, but to await the result of the healing of the wound. The edges of the wound were loosely approximated, and water-dressings applied. For some days the pain was entirely relieved, although, from the effect of the habitual use of morphia, a small dose was required to promote sleep. As the wound began to heal, however, the pain recurred, but with much less severity than before. Desiring

now to return home, one of his family was instructed in the use of the subcutaneous injection of morphia. About two months afterwards he called on me, and again (March 20, 1863) four months after the operation. He was then in a state of perfect health, and had gained much flesh, but complained still of neuralgic pain in the hand, requiring the employment of the narcotic injection; whether from habit or not seemed to be a question. The arm, hand, and fingers had begun to acquire some motion. In regard to the local effect of the injections, it may be said, that, although they had been used twice a day for five months, he had never suffered from any irritation at the point of puncture, except in one instance; in the case of a freshly prepared solution of sulphate of morphia, the use of which was followed by the production of a large red blotch, whenever it was injected. On substituting a solution of acetate of morphia, no farther trouble of this nature was experienced. This accident is probably to be explained by the common practice of adding free sulphuric acid to promote the solubility of certain specimens of sulphate of morphia. The acetate is very soluble in water. The patient had had nearly three hundred injections of morphia; and, with the above exception, no traces remained of its protracted use.

Oct. 26, 1863. — I saw this patient, and found that he had recovered his health, and enjoyed complete immunity from pain. The hypodermic injections were continued until the month of July, or about nine months from the receipt of the injury. He then, by a great effort, suddenly discontinued them, and had not used them since. The neuralgic affection, except during extreme changes of the weather, had left him. The fore-arm had recovered its natural sensibility: he had the power of complete flexion of the elbow, and of partial rotation of the fore-arm; while the fingers, which were formerly held in a state of extension, could be approximated to the thumb, so as to make the hand useful for most of the ordinary purposes of life. This motion was continually improving.

CASE CCLXVIII. — *Gunshot Wound of the Thigh, implicating the Sciatic Nerve.* — In April, 1864, I had under my

care, in the Hospital, a soldier, who, two months before, was shot in the thigh, and taken prisoner. The ball traversed the thigh from side to side, and probably injured the sciatic nerve, in the immediate neighborhood of which it must have passed. He suffered no inconvenience in the site of the wound ; but, shortly afterward, a severe neuralgic pain commenced in the sole of the foot, accompanied by a sensation of heat and great tenderness of the part, and entirely incapacitating him for locomotion. Opiates, in the usual form, gave him but little relief ; and the only alleviation of his sufferings, while in prison at Richmond, was obtained by keeping the leg constantly plunged in a pail of cold water.

I ordered the subcutaneous injection of a quarter of a grain of morphia daily into the leg, and gradually increased the dose to a grain a day. By this treatment, the pain was completely held in check, rendering his days and nights comfortable. The full effect of each dose was obtained in from five to ten minutes after injecting it. The patient left the Hospital very much relieved ; and I lost sight of him afterward.

In the course of this case, I experimented as to the effect of the injection, when made at a distant part of the body, as compared with its effect when applied in the immediate vicinity of the affected nerve. I found that, when the injection was made in the opposite limb to that affected, the relief was as prompt and as complete as when made directly over the course of the nerve ; and this occurred repeatedly, in every instance in which it was tried. This is a point of very considerable importance, inasmuch as it is often very inconvenient to make the injection in the exact situation of the affected nerve, as has been strongly insisted on by several writers upon this subject.

CASE CCLXIX. — *Injury of the Ulnar and Musculo-Spiral Nerves, from a Bullet.* — Captain C., who had already been twice wounded in the thigh and leg, in the battles of Winchester and Fredericksburg, was struck at the battle of Gettysburg by a ball, just over the median nerve of the arm. It passed in a spiral direction around the bone, and came out half-way down the limb below on the other side. The hand and fore-arm were at once partially paralyzed ; and, in a day or two,

very severe neuralgic pains commenced, principally in that part of the hand supplied by the ulnar nerve. When I first saw him, about a week after the injury, the arm was much swollen; and the wounds, which had still on them the cold water-dressing, were in an irritable state, and there was no appearance of suppuration. The water-dressings were replaced by a large warm poultice; and, on a free suppuration being established, the extreme pain in the arm and hand was much relieved. The pain, however, still continued to recur at intervals, and the paroxysms coming on at night were very severe. Finally, the hypodermic injection of morphia was tried, and a single dose of one-half grain afforded entire relief for the time being; and, in fact, destroyed the habit so that the paroxysms did not recur. The hand and arm, however, for a long time afterwards, were very uncomfortable, on account of the excessive heat of the parts, which was only relieved by the constant use of cold water; and it was not until after several months that the normal sensibility began to return, and this symptom to disappear. Seen again at the end of five months, he was free from neuralgic pain, had some use of his hand, and the elbow had become flexible after employing forcible extension to overcome the stiffness produced partly by inaction, and partly by the contraction of the injured muscles. The movement of rotation of the fore-arm had not been recovered, although it could be easily made by a second person, the nervous power being still deficient.

The three cases which follow are instances of excessive neuralgia affecting the inferior dental nerve, in which all known medical means had been resorted to without avail, and where life had become insupportable. An entire relief was the result in two of the cases, and a partial relief in the other, by trephining the inferior maxillary bone near its angle, exposing and excising a portion of the nerve as it lay with its vessels in the bony canal.

CASE CCLXX. — *Facial Neuralgia. Trephining the Lower Jaw, and Removal of a portion of the Inferior Dental Nerve. Partial Relief.* — In October, 1859, a young man, 23 years

of age, entered the Hospital on account of facial neuralgia, of two or three years' duration, in the right side of his face. When the pain first appeared, it was attributed to carious teeth, which were removed, but without relief. The pain was very severe and paroxysmal, occurring after speaking or eating. Brisk friction gave temporary relief. He was treated by tonics and narcotics internally, and by hypodermic injections of morphia. The extract of conium, in doses of five grains, seemed to give most relief. On Nov. 12th he was discharged, relieved.

The relief, however, was only temporary. He entered the Hospital again, Aug. 20, 1861. Meanwhile he had been operated upon, and two nerves divided in the upper jaw.

His jaw was now trephined by one of the surgeons of the Hospital, who removed a portion of the bone half an inch in diameter, with the contained portion of the inferior dental nerve. He had entire relief for three or four months, at the end of which time he experienced occasionally attacks of pain: their severity and frequency increased; and on the 22d of April, 1863, he again entered the Hospital, and came under my care. Quinine and Fowler's Solution internally, and subcutaneous injections of morphia, were tried without effect; the pain rather increasing. He insisted on another operation, which was done on the 23d of May; being, of course, under ether. An incision one and a half inches long was made parallel to the body of the jaw near its lower border, and another one joining this made along the edge of the ramus. The flap was dissected up, exposing the bone. A portion of the ramus near its junction with the body of the jaw was denuded of its periosteum. A piece of bone half an inch in diameter was now removed by a trephine just below the inferior dental foramen. Great care was necessary while trephining, in order not to fracture the jaw, so much of its substance having been excised at the previous operation. After removing the bone and exposing the nerve, half an inch of it was taken away. Temporary relief followed the operation. The disease, however, afterwards recurred, but in a mitigated form; and his subsequent history is not known.

It is important, where the bone is excised on the ramus of the jaw, not to go above the internal aperture, where the dental

nerve penetrates the jaw. Otherwise, the whole substance of the bone will be removed; and the gustatory nerve, as it passes along the inner side of the ramus of the jaw, may be mistaken for the inferior dental nerve.

CASE CCLXXI. — *Neuralgia. Relief by Trephining the Lower Jaw-bone for the Removal of a portion of the Inferior Dental Nerve.*—In July, 1847, Dr. J. C. Warren removed a portion of the inferior dental nerve by trephining the body of the jaw in a lady fifty-nine years old, and thus afforded her relief from an excruciating neuralgia of three years' standing. She had no recurrence of the pain until a year after; and then the suffering returned, and became so severe as to confine her to the bed. She was unable to eat or speak without causing a paroxysm of pain. The pain commenced in the lower jaw, always at the same spot, and thence extended over the whole side of the face.

A year and a half after the operation, her son, a medical man, applied to me, saying that something must be attempted for her relief. I suggested an operation for trephining the jaw farther back than had been done before, and removing a portion of the nerve near where it enters the inferior dental foramen. This was readily agreed to.

An incision being made from the sigmoid notch down to the edge of the jaw, the parotid gland was raised and turned back. The lower portion of the masseter muscle was now dissected up, and a section of bone removed by means of the trephine and chisel. Half an inch of the now fully exposed nerve was excised. The inferior dental artery was unavoidably cut and tied.

For five or six days subsequently, there was a slight discharge of saliva from the wound, owing to the interference with the parotid; but it healed favorably, and the operation was attended with the most complete relief. I heard from the patient a year afterwards, and there had then been no recurrence of the neuralgia.

CASE CCLXXII. — *Facial Neuralgia. Trephining the Lower Jaw, and Removal of a portion of the Inferior Dental*

Nerve.—1858. A lady, aged 40, had suffered for eight years from neuralgic attacks in the right side of the lower jaw. At times, the pain was excruciating. During this period, every kind of treatment that the best-directed skill and judgment could dictate was employed, but without avail. All the teeth in both jaws had been extracted, but with only temporary relief. I was called in consultation in 1854, and then advised an operation; but she declined to undergo it. The pain extended from the jaw to the upper part of the face; and her sufferings became so great as to confine her to her room, and reduce her strength. For the greater part of the six months before the operation, she was kept under the influence of morphia. The slightest motion near her, or an unexpected draught of air, were sufficient to excite an attack. Under these circumstances, finding that all the means tried had failed to relieve her, she consented to an operation.

Under ether, the jaw was exposed at the edge of the masseter muscle; and, the latter being raised, the trephine was applied, and a circle of bone about half an inch in diameter removed. This opened the inferior dental canal. The nerve was now lifted on a probe, and as large a portion of it as the aperture would admit of excised. It was again divided where it issues from the mental foramen. The enlarged and irregular alveolar processes were next cut away with the bone forceps.

She recovered rapidly from the operation; and, for a year, enjoyed entire immunity from the neuralgic attacks. From that time to 1867, a period of more than eight years, there were occasional paroxysms of facial neuralgia, with considerable general nervous disturbance; but she had not been confined to her room except during these attacks. During the intervals, she had been in fair health.

CASE CCLXXIII.—*Neuralgia. Excision of the Digital Nerve of the Forefinger.*—A lady, 35 years of age, in 1843, was seized, while pregnant, with a severe pain in the tip of the forefinger of the right hand. The only cause to which she could attribute it was the too free use of the needle. The pain had gradually increased, affecting the arm and shoulder, and finally

other parts of the body on the same side. Every remedy which the experience of distinguished surgeons in the vicinity could suggest had been ineffectually tried. Aside from the above disease, her health was good, and she was in good condition. The appearance of the finger was somewhat red, and the motions impaired. The slightest examination caused excessive suffering. Although informed that the success of an operation was doubtful, she consented to its performance, and it was done in the following manner:—

After she was etherized, an incision was made a little in front of the inner aspect of the first phalanx of the finger, the digital nerve exposed, and about half an inch of it excised. The same operation was repeated on the other side. The end of the finger became at once benumbed, and the pain ceased. She returned home five days after, free from pain; and, two months later, I heard that she was perfectly well.

The operation, so far as I have since learned, was successful; but it must be confessed, that, in operations of this kind, the relief is very apt to be but temporary. However, a mitigation of suffering, even for a time, renders it worth while to perform it; and I am not aware that any permanent ill effects arise from it.

CASE CCLXXIV.—*Injury of a Nerve from Puncture with a Needle. Treatment without an Operation. Cure.*—A lady, 35 years of age, of delicate organization, was sent to me, for a stiffness and loss of use of the thumb of the left hand, owing to an injury from the prick of a needle, received about a month before. The injury was not attended with much pain at the time, but an irritation shortly commenced in it, which extended up the arm to the shoulder; and, without much apparent inflammation of the lymphatics, a swelling took place near the axilla, which suppurated. The whole hand became more or less stiff and useless.

When I first saw her, the thumb itself was entirely immovable: any effort made to approximate it to the forefinger caused great pain, and the whole appearance led me to suppose any attempt at restoring its motions would be likely to result

in failure. I recommended to her a tonic course, and free exercise out of doors; to bathe the whole arm with warm salt and water twice a day, and the hand and thumb with an anodyne embrocation, alternated with frictions of sweet oil. The thumb itself was kept constantly warm and moist by the use of a loose cot of oiled silk.

Under this treatment, more or less varied from time to time, the patient very gradually recovered a little motion in the thumb. The improvement, however, was very slow, and scarcely perceptible from week to week; and it was many months before she could allow the passive motion even of the parts. By perseverance in this course for nearly a year, she ultimately recovered; and I saw her some years afterwards, when she consulted me on the case of one of her children, without any return of it.

This treatment of warmth and moisture, with entire rest of the limb, combined with an invigorating course for the general health, I have found effectual in a number of cases.

CASE CCLXXV. — *Neuralgia of the Forefinger from an Injury. Operation.* — In December, 1861, a young man, 19 years old, applied to me to amputate the forefinger of his right hand, on account of its excessively sensitive condition, produced by an injury which he had received nine years before. The finger had been caught in a fulling mill, the soft parts lacerated, and the bones crushed. Under the skilful care of his physician, the finger was saved, with but a partial stiffness of the phalangeal articulations. The skin, however, was left in a state of exalted sensibility, so that he could not bear the slightest contact of it with another body; making it almost impossible for him to dress himself, or to pursue his ordinary avocations. When he consulted me, he had undergone almost every conceivable kind of treatment, and was desirous of relief from further suffering, even at the expense of amputation. I proposed to him, before submitting to its removal, to make trial of a course of treatment which I had found successful in a number of similar cases arising from traumatic causes. This was to keep the whole limb in a state of perfect rest, confined by a sling beneath the clothes, so that the act of dressing should involve no muscular

exertion; secondly, to keep the whole capillary circulation of the arm stimulated by wearing a sleeve of oiled silk, extending from the shoulder over the hand, and closed at the end so as entirely to exclude the atmospheric air; thirdly, to be put under a full course of the iodide of potassium. He agreed to adopt this plan, and report to me in a fortnight; but did not make his appearance again until the fifth of March, after an interval of two months and a half, when he would not admit that he had experienced much benefit. I now proposed to him to have the finger girdled by subcutaneous incisions, so as to destroy the whole nervous supply to the finger, sparing, of course, the extensor and flexor tendons.

The operation was performed, and resulted in the entire relief of the pain. Two years after, I heard from the patient: the finger was then of good color, and free from pain; but there was entire loss of power over it, and it remained constantly cold.

CHAPTER XI.

TUMORS.

IN the present chapter, it is proposed to give instances of innocent and malignant tumors, with the operations for their removal. The subject of their pathology will not be entered upon. Since the work of Dr. John C. Warren on Tumors, published thirty years since, the subject has been ably elaborated both in this country and Europe.

The diagnosis and treatment of tumors, and the operations performed for their removal, constitute one of the most important departments of surgery. In many operations, such as the ligature of arteries, amputations of limbs, operations on the bladder, &c., certain exact rules can be laid down for the guidance of the surgeon; but with tumors the case is different. They are situated at times merely in the integument; again they are found deeply imbedded in the tissues, and not infrequently involve important arteries, veins, and nerves. For their safe removal, a thorough anatomical knowledge and presence of mind on the part of the surgeon are absolutely requisite. The patient to be operated on should be well etherized, and in a recumbent position as a general rule: the incisions in the skin should be free, as they facilitate the subsequent stages of the dissection. The envelopes of the tumor are to be cut down upon boldly, without too much preliminary dissection. In the removal of tumors from deep and dangerous situations, it is well to secure the vessels as they are divided.

Great care is necessary in the operation for recurrent tumors situated deeply in the neck, from the adhesion, and at times incorporation with them, of important vessels and nerves. The question of the propriety of operating upon leucocythæmic glan-

dular tumors occurring in the neck has recently arisen. The true nature of these growths was first described in 1845, by Bennett and Virchow. They are characterized by an increase of the number of white corpuscles in the blood, and are frequently co-existent with an enlargement of the spleen and lymphatic glands. They are usually seen by the surgeon as a mass of soft, movable tumors in the neck, and are a source of inconvenience in respiration; but do not, as a rule, give much pain. In those that I have seen operated upon, some have recovered, others have died; the disease in the latter being found to have extensively invaded the glands of the chest. According to the present state of our knowledge, when other treatment fails, the tumors may be removed in the hope of relief or palliation, just as we operate upon scrofulous glands or malignant growths. The subject, however, remains undecided.

The question of the removal of malignant tumors by surgical operation has been a subject of discussion from the time of the Father of medicine. It was the opinion of Hippocrates that the disease had much better be left to itself; and that the patient died sooner when the attempt was made to remove it, than when it was allowed to pursue its natural course. The same views, substantially, have been held, until within a few years, in England and the United States.

In a report made to the American Medical Association in 1852, supported by cases which had occurred in my own practice, I felt justified in drawing the following conclusions: first, That, in a certain number of cases, malignant tumors, once removed, do not return; secondly, That, in certain other cases, the patient, after an immunity for a longer or shorter period, has a return of the disease, requiring a second operation, which sometimes proves successful; thirdly, That, although in a great proportion of cases of extirpation, the disease returns, either in the neighborhood of the wound or in some internal organ, yet, even under these circumstances, it generally re-appears in a less loathsome form, and is attended with much less suffering, than if the original local disease had been allowed to proceed to a fatal termination; fourthly, In consequence of the immunity from pain afforded by the use of anæsthetic agents, one of the

most serious of the old objections to extirpation no longer exists.

After an experience of fourteen years since this report was made, I feel even more fully convinced of the propriety of removing malignant tumors,—particularly of the breast,—except in cases of marked impairment of the health from the disease, or when there is evidence of decided constitutional infection; and this opinion would be justified, even if we admit that the disease is never really destroyed by surgical removal. I am fully confident, however, that, in a certain number of instances, the disease is radically extirpated by the operation. There are still living, and in good health, several patients upon whom I operated for undoubted malignant disease ten or fifteen years since. I have also a patient, now in a state of perfect health, in whom the disease occurred five separate times within two years, and was as often removed; the last time, more than six years ago. In another case, operated on in 1859, in which a large scirrhus tumor of the breast was rapidly approaching the surface, the whole disease was removed, and the patient recovered her health. At the end of eighteen months, a tumor appeared in the axilla, which, after attaining the size of an apple, was enucleated from among the great vessels and nerves. At the end of a year, a hard tumor, imparting almost a bony sensation, appeared near the spinous process of one of the dorsal vertebræ: this was also removed; and the patient finally died, with cerebral symptoms, four years after the first operation. During all this period, she was cheerful; and most of the time was able to take long journeys, and to enjoy the society of her friends: the question of cancer was never mentioned between herself and her surgeon. This is an extreme case; and perhaps some might question the choice between a large ulcerated, sloughing cancer, and the alleviation, both mental and physical, afforded by repeated operations.

In regard to the propriety of operating for the removal of epithelial disease, of course there can be no question: cases of cancer of the lip and of the face being of constant occurrence, in which there has been no return of the disease after its removal.

The cancers of the breast, which, according to my experience, have been the most painful, rapid, and least amenable to surgical treatment, are those developed during lactation; and they often occasion great embarrassment in diagnosis. The breast swells, becomes indurated, and presents the appearance of an obstruction in the lactiferous ducts: in spite of remedies, however, the hardness increases; the skin becomes rough and brawny, and the whole organ solidly fixed to the ribs; cancerous tubercles appear in the vicinity: and the patient often dies with either cerebral or spinal symptoms. The wound made by the removal of a tumor of this kind is very large, usually involving the loss of the whole integument over it. I have once or twice operated for this disease, — at the earnest solicitation of the patient, on account of intense pain, — dressing the wound afterwards with flour, which avoids the necessity of subsequent exposure to the air during the dressings.

It is not unworthy of notice, that in removing large tumors on the left side of the chest, over the region of the heart, great depression of the vascular system, attended with symptoms of collapse, is often seen to occur from the exposure of the large surface to the air; the symptoms disappearing as soon as the wound is covered. I have therefore made it a rule, while the vessels are being secured, to expose only as small a portion of the wound as is absolutely necessary.

The question of the destruction of malignant disease by means of caustics is one of much interest, the practice having found both advocates and opponents among men most distinguished in the surgical art. Great mischief is done in this way by charlatans, who make use of caustics for the destruction of all kinds of tumors, innocent as well as malignant, whose removal they would never dare to attempt with the knife. The chief objection to the use of caustics, in all but a few exceptional cases, is the extensive destruction of integument, which often renders the cure very slow and imperfect. In cases of small or superficial malignant tumors, especially of the epithelial variety, caustics sometimes answer a good purpose; but if the tumor is large, or deeply seated, the process is both tedious and disgusting. If inefficiently employed, they appear to do great harm by stimulating the growth to increased action.

The most efficient caustic, perhaps, is the chloride of zinc, made into a paste with flour, and planted well down into incisions made with the knife. Another, advocated by Velpeau, and I believe also by Mr. Syme, consists of strong sulphuric acid, mixed with charcoal or some vegetable powder. The treatment of cancer with the hypodermic injection of dilute acetic acid, introduced by Dr. Broadbent, has lately been attracting much attention in England; and, from the evidence given in its favor, certainly deserves a fair trial. Small cancerous tubercles probably offer the best subjects for it. I have seen the effect of it only in one case; a large, solid, fixed tumor of a hopeless character, situated just behind the ear, in a male patient of about 40 years of age. In this case, the surface of the tumor was first laid bare by a free incision, and the acid injected into its substance. Now, at the end of two weeks, there is a discharge of thick, creamy pus from the exposed part of the tumor; and the bulk of it—which was of a scirrhus hardness—has now a sort of spongy softness. The case was operated upon, and is under the care of one of my colleagues at the Hospital.

In connection with the etiology of cancer, I would say, that I have had several well-marked cases, in which the diathesis was evidently awakened by a blow; the patient subsequently dying of malignant constitutional disease.

The following unusual case of fungoid tumor, apparently originating in the dura mater, operated on by Dr. J. C. Warren, is introduced here, with the colored delineation of it which forms the frontispiece, on account of the remarkable features connected with it. The patient applied to me for advice once or twice, some years after the operation, and I have been able to follow the history of the case since.

CASE CCLXXVI. — *Fungoid Tumor of the Forehead.* (See Frontispiece.) — "In the year 1846, a young lady applied to me on account of a tumor on the forehead, near the right temple, having the aspect of a periosteal tumor.

"I advised an incision across it, to ascertain its character, and, if found to be susceptible of an operation, that it should be

removed. This was not done ; and in October, 1847, she again presented herself. The tumor was then of two years' growth. It was of large size, approaching that of a lemon ; its surface was ulcerated, fungoid, and bleeding. There was no pain in it, nor any cerebral affection. Under these circumstances, I advised that the tumor should be cut out, if possible, and the bleeding surface cauterized.

"Oct. 27th. A projecting fungus, of two or three inches' height and width, was first removed, and sufficient evidence obtained of its being of a fungoid character, if any were wanting. The surrounding skin, temporal fascia, and muscle, were divided on each side of the tumor, which, while it extended a space three inches in diameter under the skin, was found to have a contracted cervix of not more than an inch and a half in diameter. Around this cervix was found the edge of a perforated bone. An instrument, passed along this edge, entered the cavity of the cranium. The tumor being cut down close to the bone, the actual cautery was applied by a succession of heated irons. There was a copious hemorrhage ; but one or two ligatures only were applied. The patient, being under the influence of ether, suffered nothing.

"Nov. 6th. The patient had no bad symptoms after the operation. At this time she was sitting up, quite comfortable, and experienced no pain in the head. The wound, however, had an unfavorable aspect ; its edges were nearly an inch thick, and had a puffy or swollen appearance. The fungus had again shot up half an inch, and required the daily use of caustic potash. From this time to the 15th of December, the caustic was frequently applied, but was subsequently omitted ; and, on the 17th of January, there was a small shell of exposed bone to be found at the bottom of the cavity, which was about two lines in diameter, with healthy granulations. On the 31st of August, it is recorded that the wound closed soon after leaving the Hospital ; the shell of bone previously described still remaining in situ, none ever having come away. Health good."

I was consulted by this patient some five years after, with a slight appearance of a return of the tumor. It, however, did not seem disposed to increase rapidly ; and as she had no suffer-

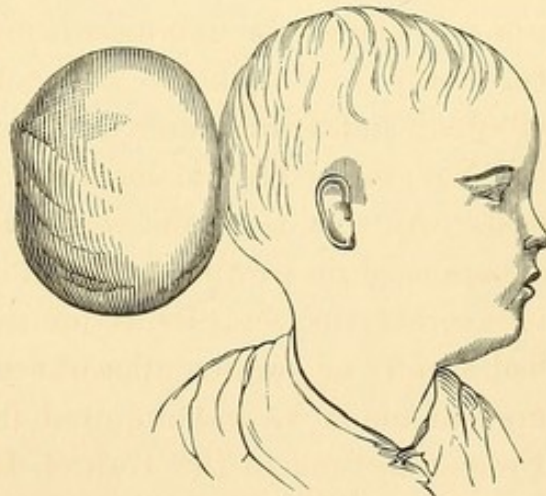
ing from it, and her health was not affected, I did not feel disposed to interfere by another grave operation. I kept her under observation for a time, but finally lost sight of her.

About ten years after this, I was consulted again by the father of the girl, in regard to the propriety of another operation. He informed me that she had since been married, and gone to California; that she was quite well; that the tumor had partially returned, and that she was desirous of knowing whether another operation could be performed. I advised her as before.

In July, 1866, I learned the following particulars from her father. She was still living in California, and suffered no inconvenience from the tumor. It had slowly enlarged, until three years ago, since when it had undergone no material change.

CASE CCLXXVII. — *Extraordinary Tumor on the Head of a Young Child removed by Operation.* — The following case is thus described by Dr. J. C.

Warren: — "In the month of April, 1843, Mr. —, of Dover, N.H., wrote to me to come to that place, to examine a tumor on the head of his child.



"The child was a nursing boy, eight months old, quite healthy: a week after his birth, a tumor of the size of a pea was discovered on the back part of his head. This increased pretty rapidly, and the father at once consulted the medical gentlemen in his vicinity. Some thought it solid, others thought it fluid; some advised him to have it destroyed by caustic, and others to apply a ligature about it. The latter advice, being considered the most safe, was adopted: a ligature was tied around the base of the tumor where it sprang from the head, not tight enough, however, to strangulate it, but merely to irritate the skin on which it was applied, which of course produced no impression

on the disease; yet this application was continued for three months.

"Not being able to visit the patient, I advised that the child should be brought to Boston. On the 3d of May, he was accordingly brought.

"On examination by Dr. J. M. Warren and myself, we found on the back of this child's head a tumor almost as large as the head itself, of a globular form. It was elastic to the touch, not undulating, nor sensitive to pressure. It retained the natural color of the skin, except where the arteries and veins ramified over it; these vessels were enlarged, and their branches and inosculations presented a beautiful appearance: there was no pulsation. On moving the body of the tumor, it did not appear to adhere closely to the bone or periosteum.

"From this examination, my opinion was that the tumor was of solid growth, supplied by the vessels of the skin and those of the occipito-frontal muscle; that it was not malignant in character; that it might and ought to be removed. The operation was performed the day following, May 4, 1843, by Dr. J. M. Warren.

"An incision was made into each side of the tumor, comprehending skin enough to cover the wound, and the tumor readily dissected off from the bone; six arteries were tied, and the skin brought together by strips of adhesive plaster.

"On examination of the tumor, I found it to be covered and insulated by a complete coat of cellular texture. Being divided, it presented a very white, uniform, granulated texture, interrupted only by some irregular partitions of cellular tissue. The microscope discovered nothing beyond what has been stated above. The most remarkable circumstance about this tumor was its firmness, which was very nearly equal to that of fibro-cartilaginous texture. On scraping the cut surface of the tumor with a knife, an opaque fluid was obtained in considerable quantity, similar in appearance to turnip juice and to the fluid obtained by scraping a scirrhus tumor of the breast.

"The wound, which was about five inches long, was found united almost wholly in two days after the operation. The child had no fever, nor any sign of indisposition; but, on the contrary,

expressed by its movements a feeling of relief from the encumbrance it had so long borne. The child being so well, the parents, on the third day, took it home to Dover, much gratified with the result of an operation which they had imagined to be more formidable in its execution, and more protracted in its consequences.

Remarks. — "The mother attributed the growth to her having, when pregnant, accidentally stumbled over a basket of oranges; the tumor resembling this fruit in its form.

"The dissimilarity of this tumor to the texture from which it sprang would lead to the opinion of its being a cancerous formation. Its consistence, color, and the fluid obtained from it by expression, were most similar to the appearances in a scirrhus of the breast. On the other hand, its perfect insulation by a sac from the surrounding textures, the nature of the connection of this sac with those textures, and their perfectly natural condition, enabled me to assure the parents of this child that there would not be a recurrence of the disease."

This case is interesting from its resemblance to another tumor which we occasionally see arising in the same situation, and which springs from the interior of the cranium. Mr. Costello, in his "Cyclopædia of Surgery," under the head of Encephalocele, gives a description of the disease, with drawings, one of which, with a broad base, resembles the present tumor. About the time that this case came under our care, a child was brought to our surgical infirmary, with a congenital tumor apparently of a similar character. It was examined by many surgeons, and supposed to be a tumor, springing from the cranium, of an encysted character. It was therefore decided to remove it.

The operation was nearly completed, the dissection being very easy, when it was found that a small pedicle of the tumor penetrated the cranium, or, in fact, came out from it, as the tumor proved to be an extension of the membranes of the brain. The pedicle was divided with great care, and means were taken to prevent any air from coming in contact with the interior of the sac, the skin being brought together over it at once. The patient, however, died in a few days, with cerebral symptoms.

In the case first related, it was thought possible that the dis-

section might in some way interfere with the cranial cavity ; as a rim of bone could be felt quite round the circumference of the tumor, such as is not unfrequently seen where the tumor has lodged for a long time in contact with the cranium, and which always renders the diagnosis a little difficult.

TUMORS IN THE PAROTID REGION.

The tumors usually found in this region, either originate in a small gland placed over the parotid, or are embedded in its substance, or are placed under its lower edge, which is expanded to form a coating over the tumor, making it necessary to dissect through that portion of the expanded gland before the tumor is reached. They are, for the most part, innocuous, and are removed without great risk, although somewhat vascular. The tumors of the parotid itself are of a serious character, often of a malignant nature, and then usually scirrhus.

As to the practical question which is often raised, whether the gland can be removed without the ligature of the carotid, the result of my experience is this : The parotid gland has been removed by me in many instances, some of which are given below : in none of them was the carotid artery tied. In scirrhus affections, where the gland undergoes a gradual induration, the vessels are frequently pushed backward, as they were in one or two of the cases here given.

In a case mentioned by Dr. J. C. Warren, the carotid was cut at the end of the operation. The vessel was secured, and the patient did well. In a second case for the removal of a scirrhus parotid, in which I assisted Dr. Warren, the carotid was divided and tied. Three days after, as the patient was straining at stool, the vessel gave way, and the blood struck the ceiling. He almost at once fainted ; and the friends were fortunately cool enough to place a sponge in the wound, and to check the flow partially. Being called, I at once cut down upon the vessel in the neck, tied it, and stopped the further effusion of blood. Bérard, in his monograph on this subject, mentions many instances of removal of this gland without ligature of the carotid, and quotes a case of extirpation of the parotid

by my grandfather, Dr. John Warren, in 1804, removed without tying this vessel, — the facial nerve being divided, and the face paralyzed. The patient lived fifteen years afterwards, and died of a disease foreign to the glandular affection.

The following cases are illustrative of the above facts, and also of some peculiarities in the nature of the tumors themselves :

CASE CCLXXVIII. — *Parotid Tumor. Removal.* — A young married woman entered the Hospital in April, 1857, with a tumor of the parotid gland of one year's duration. Eight years before, she had a tumor below and behind the right ear, which was very hard and occasionally painful : the integument was not discolored. At the end of four years, having attained the size of a robin's egg, it was removed. The wound, she thinks, never cicatrized ; and, in four months, the tumor, having re-appeared in the midst of the scar, was again removed. Its character was similar to the preceding, with the exception that the surface was nodulated. The wound healed as usual, but the cicatrix remained very red. In 1855 the tumor began to form about in the same place ; and in 1856 was as large as a hen's egg, projecting an inch, with a nodulated and red surface. Beginning below the ear, it proceeded upward and forward to about half an inch in front of the meatus.

On the first day of May, 1857, the patient being etherized, the diseased mass was surrounded by an elliptical incision. From the situation of the disease, the dissection was made very slowly, requiring nearly an hour for the operation. At the lower part was a firm adhesion to the fibres of the sterno-mastoid muscle, a portion of which was removed. At the upper part, it was necessary to carry the dissection down to the articulation of the jaw, below and behind the angle of which the disease descended deeply, rendering necessary the exposure of the tendon of the digastricus. On raising the tumor to continue the deep dissection, violent efforts at vomiting, difficulty of breathing, and convulsive retchings from the traction exercised on the deep nerves, came on, so that it was necessary to desist, and destroy the small portion of the base of the tumor with the hot iron. A few ligatures were applied ; and the wound, measuring three inches and

a half vertically by two transversely, was covered by a wet cloth. The growth measured vertically three inches. The face was more or less paralyzed after the operation.

She was discharged from the Hospital on the 18th of June; all the disease being apparently removed, and the whole wound reduced to a diameter of one-third of an inch. In the middle of September following, a letter was received, saying that the patient remained well, and the wound was healed.

CASE CCLXXIX.—*Scirrhus Tumor of Parotid. Removal.*—The patient was a farmer, 52 years old. Twenty-five years before, a tumor made its appearance in front of the ear. This imperceptibly increased, giving him no pain or inconvenience until two months before the operation, when it was injured by a blow, and since then rapidly increased in size. The night after the blow, he perceived that there was some insensibility in the skin in front of the tumor. For some time, he had been unable to close the right eye. "Now there is an oval, prominent, even, well-defined tumor in front of the right ear, overlying the ramus of the lower jaw, and occupying the position of the parotid gland. Its long axis is parallel with a line drawn from the angle of the jaw to the external angle of the orbit. Its greatest length is three inches, width two inches. Upper margin is on a level with the angle of the eye; lower margin with the angle of the jaw; posterior is overlapped by external ear. Integument is movable; not discolored. Tumor is of firm consistence; not tender on pressure; not attached to bone, yet but slightly movable; does not move with lower jaw; cannot be felt in mouth. There is much numbness of cheek in front, and a dull, but not severe pain in the tumor itself."—*Hospital Record.*

When the patient entered the Hospital, one or two glands in the neighborhood of the tumor were enlarged, apparently from the effect of some irritating application which had been made to it. Under treatment, these, with one exception, disappeared. He was extremely desirous of having the tumor removed; and, on a consultation of the surgeons, it was decided that this should be attempted.

The patient being etherized with chloric ether, an incision was made from just above the superior border of the tumor to a little below its inferior part. This was crossed by another incision, commencing at the mastoid process, and terminated on the cheek. The fibrous capsule of the gland was now cut into, and the tumor gradually loosened by dissecting carefully around its circumference. Its adhesions were so close and the texture so firm, that it was found impossible to proceed except with great caution; the vessels that were divided under the edges of the tumor being secured with much difficulty. The tumor was first loosened from its attachment to the zygomatic process, then dissected from the masseter muscle; the transverse facial artery and the parotid duct being divided at this stage of the dissection. It was next detached from its firm adhesions to the sterno-mastoid muscle and mastoid process, and its adhesions to the ear cut off. Finally, by means of the blade and handle of the knife, it was separated from the great artery and vein which lay embedded in its posterior wall, the latter being cut and tied. Four or five arteries required ligatures. An enlarged gland in the neighborhood was removed separately from the tumor.

The mouth was found paralyzed after the operation. The eye, which the patient was unable to close before, either in sleep or when awake, was found, a few days subsequent to the removal of the tumor, to drop down, so as partially to cover the eyeball when he was asleep.

An examination of the tumor, after its removal, showed it to be the parotid in a scirrhus state; the microscope disclosing an abundance of cancerous cells: with it was included a lymphatic gland embedded in its lower and under portion.

The presence of the parotid duct and the facial nerve in the tumor, together with its anatomical relations, left no doubt as to the organ diseased.

CASE CCLXXX. — *Melanotic Disease of the Parotid Gland. Operation by Ligature, cutting, and freezing.* — A seaman from Maine, unmarried, 25 years of age, entered the Hospital in 1852 with a melanotic tumor. For three years before, he had had a small black fungus upon the right cheek,

in front of the ear, and the glands of the neck became somewhat irritated.

At the time of his admission, there was an irregular, lobular tumor, the upper part of which was surmounted by a black fungus as large as a walnut, occupying the right parotid region, where it was slightly movable, descending below and behind the angle of the jaw, where it was immovable.

The patient being fully etherized, the tumor was surrounded by an elliptical incision, and the dissection commenced. Blood, however, followed every stroke of the knife, and poured from the whole surface of the tumor, so as only to be checked, and the further prosecution of the operation allowed, by applying the freezing mixture, and constant compression of the carotid. After the removal of some easily detached portions, by the advice of the surgeons present, the operation was finally terminated by transfixing it at the base with a very strong double ligature, and tying it in two segments. Before this, many ligatures were placed on bleeding vessels, and the hemorrhage was very great. Wherever the tumor was cut or broken, a great amount of thick granular fluid, of a jet-black color, flowed out.

Upon partial recovery from the effect of the ether, hemorrhage from the tumor continued to such an extent as to render it necessary to again encircle the base by a strong ligature. The tumor ultimately returned.

CASE CCLXXXI. — *Parotid Tumor. Removal.* — A married man from Nova Scotia, 58 years of age, entered the Hospital in April, 1854, with a parotid tumor of twenty-six years' standing. It was situated on the left side, and extended downward, lifting up the lobe of the ear, partially closing the meatus, and causing some deafness. The integument over it was injected, but not adherent. The pain, for a short time, had been severe, preventing sleep. It was considered of so formidable a character, that the surgeons to whom he had applied declined interfering with it.

The patient being etherized, the tumor was removed by a crucial incision through the skin, followed by a careful dissection, terminated without the ligature of the carotid artery. The hem-

orrhage was very free; and the dissection could only be prosecuted by stopping from time to time, and applying a freezing mixture of salt and ice, so as to allow an inspection of the parts to be divided. It was found to consist of hypertrophied glandular tissue.

In a short time, he was discharged well; and, when heard from, on Nov. 6, 1856, was in good health.

CASE CCLXXXII. — *Cancer of the Parotid.* — A woman, 37 years of age, applied to me in the month of November, 1853, with a tumor occupying the seat of the parotid gland. It had appeared first, two years before, in front of the ear; and, in its increase, had extended downward and under the ear, lifting up the lower part of that organ. It was a little movable, and did not project much beyond the surrounding parts. It appeared firmly attached below, was somewhat lobulated, and imparted a sense of elasticity to the touch. Her father died of cancer.

The tumor was exposed by a careful dissection; but, on its investments being cut into, a granular matter, like cancer, exuded from it, and the hemorrhage was very violent, welling up, as if from the carotid or some very large vessel. It was therefore found necessary to terminate the operation by the ligature *en masse*, as in the case of the melanotic affection.

The disease, examined under the microscope, exhibited well-marked cancer-cells.

I learned that she died subsequently of a tumor of the abdomen.

CASE CCLXXXIII. — *Tumor of Parotid. Removal.* — A lady applied to me on June 18, 1859, on account of a tumor of the parotid gland. She was 43 years of age, and enjoyed fair health, although dyspeptic: none of her family, that she was aware of, had ever been affected with tumors. About two years before, she perceived a small swelling over the ramus of the upper jaw, just in front of the external meatus of the ear. She supposed it, and so did others, to be a tumor proceeding from the bone. During 1858, it increased much more rapidly than in the year before; and she was finally induced, by the

advice of her physician, although extremely nervous in regard to it, to apply to me for advice.

The tumor then was about the size of a hen's egg, placed nearly over the articulation of the jaw, and extending to the malar bone. It did not extend down behind the jaw, elevating the lobe of the ear, a direction most of these tumors are disposed to take. It was perfectly solid and immovable, and, in any other situation, might have been taken for a disease placed between the periosteum and the bone, so firmly was it fixed. It did not partake of the motions of the jaw, which moved independently of it. There was no pain attending it. The patient was deaf on that side, which she attributed to pressure of the tumor on the auditory passage. As it was increasing, with the probability of taking a deep direction, and as it seemed limited to that portion of the parotid more superficially situated, I advised an operation, at the same time informing her friends that there was a possibility of its recurrence. I said possibility, rather than probability, because I have once or twice seen tumors of this description which were completely limited to the parotid capsule, and of an almost osseous firmness, removed without recurrence. The patient and friends having agreed to an operation, it was performed on June 24th; one or two gentlemen who assisted at the operation thinking, from the firmness of the tumor, that it must be an enchondroma.

An incision being made over the whole length of it, and crossed at right angles by another, the entire tumor was exposed by dissection. The parotid capsule being next cut into, allowed a granular matter to escape, having the appearance of colloid. The dissection was now commenced in front and outside of the capsule, which was gradually dissected and peeled up with the knife and fingers, so as to remove it cleanly from the bone, and thus allow the delicate capsule of the upper jaw to escape uninjured. The facial nerve was seen emerging from the gland, and it was at first supposed that it would be necessary to divide it: it was afterwards found possible, however, to split the tumor transversely, dissect out the nerve, and leave it uninjured, with the exception of one or two of the branches proceeding to the upper part of the face. The deep part of the gland

which insinuates itself back of the lower jaw seemed to have escaped disease; a fact which I have once or twice observed, and which has been frequently observed by other surgeons. The bone, on which the tumor lay, had almost the aspect of being hollowed out by it. The wound was brought together by sutures, and cold water-dressings applied to it, with a little compression.

The patient recovered rapidly, the skin adhering closely to the bone, so as to leave quite an excavated look to that part of the face. There was no facial paralysis; but the muscular action above the orbit, on the right side, seemed lost from the section of the nerves distributed to that part, and was in strong contrast with the muscular activity displayed on the opposite temple.

This patient died about eighteen months after, from cancerous disease attacking the integuments of the face, in front of the former affection, with attendant constitutional disease.

CASE CCLXXXIV. — *Parotid Tumor. Removal.* — A healthy looking old woman, 64 years of age, came under my



care at the Hospital, June 3, 1851. Thirty-two years before, she had the mumps on the right side of her face; and, when

the swelling subsided, a permanent tumor was left, which gradually enlarged. In ten years, it had attained the size of a small orange; and a female cancer doctor was applied to, who "drew it out," leaving an open sore. When this healed, the tumor again enlarged, and after 1849 grew rapidly.

When I saw her, a tumor, such as is represented in the woodcut, occupied the right side of the face and neck. The diameter of its base was five inches in one direction, and four in the other. Its circumference about the base was a little more than a foot. It was somewhat lobulated, and very elastic: the skin of it was rather strongly marked by veins, and scarred by the applications of caustic. It was freely movable on the subjacent parts, and caused a sense of uneasiness, rather than pain.

The patient being etherized with chloric ether, two vertical incisions, semilunar in shape, were made over the tumor, including the circumscribed skin, which was adherent. Then, commencing at its lowest part, it was partly dissected, and partly peeled out. Its adhesions to neighboring parts were not very firm; but it was exceedingly vascular, and the operation was frequently interrupted to tie vessels. The jugular vein was wounded, and the sound of air entering was distinctly heard. The vein was severed, to prevent further ingress of air. At this time, she became quite faint from loss of blood.

After the removal of the tumor, the carotid artery was found exposed at the bottom of the cavity. The remaining skin was not sufficient to cover the wound, which was therefore filled with lint.

During the operation, parts of the tumor were so soft as to be pressed out between the fingers. This matter was nearly flesh-colored, and of the consistency of a soft apple.

On cutting into it, the section was found composed of similar matter in part, but in some places was quite fibrous. Under the microscope, no true cancer-cells could be found: it appeared to be composed of fibres, with granular matter interspersed.

The wound granulated rapidly, and healed without any untoward symptom.

CASE CCLXXXV. — *Recurrent Tumor of the Parotid Gland.* — A large, powerful, full-blooded man, 34 years of age, consulted me, in March, 1847, for a tumor in the right parotid gland. A tumor had been removed from the same spot twenty years before, which shortly afterwards re-appeared in the form of a small hard tubercle under the ear. For fifteen years it remained stationary, and then began to increase.

It was about the size of a hen's-egg, of a bluish color, lobulated, and having a hard base surrounded by small cysts. The lobe of the ear was pushed upward by the tumor, which extended inward, and apparently involved the lower half of the parotid gland. The patient was very desirous of an operation, and I determined to attempt its removal without first applying a ligature to the carotid, which seemed to be involved in it. Drs. J. C. Warren, George Parkman, Samuel Parkman, Dr. Briggs, and Dr. D. D. Slade, were present at the operation. This was one of the early cases of the use of ether, which was administered by Dr. Morton with his apparatus. The tumor required a very slow and careful dissection. The base of it was ossified, and pressed upon the facial nerve; and this had caused a partial paralysis of that side of the face. The removal of it was accomplished without tying the carotid artery; and the patient was sufficiently recovered in a week to return home, a distance of some hundred miles.

Some twelve or fifteen years after, this patient again applied to me with a tumor in the same situation; the face partially paralyzed on that side, the paralysis increasing as the tumor became harder.

The tumor was again removed, the wound healed, and the patient remained well for a time. A few years afterwards, he applied to me a third time, and came into the Hospital, with a large ulcerated cancer, which had returned in the same situation.

On consultation, it was decided that no operation was advisable. The patient, however, was so solicitous that I should do something, that I dissected back the flaps of skin at the base of the tumor, and then passed two double ligatures, the size of a whipcord, by means of long needles with handles, at right angles, as far beneath the tumor as possible. The ligatures were

then tied, and the whole mass strangulated. After it separated, powerful caustic applications were made; and the man, when I last saw him, had a small healthy wound, in place of the offensive tumor which he was suffering from before the operation. This tumor therefore, from its commencement to the last operation, had a course of between thirty and forty years. During the whole of this period, his general health was good.

CASE CCLXXXVI. — *Remarkable Disappearance of an Apparent Scirrhus Tumor of the Neck.* — December, 1866. A gentleman, about 50 years of age, of spare habit and in delicate health, applied to me, about two years since, with a hard tumor of the size of a large hen's egg, situated partly under the ear. It was almost entirely enveloped in the substance of the sternomastoid muscle, where it is attached to the mastoid process of the temporal bone.

The tumor was ovoid, well defined, and apparently firmly fixed to the bone: the skin above it was a little discolored. There was no tenderness in it, and no marks of an active inflammatory character. The patient said that it began, about six months before, in the substance of the muscle, and had gradually grown to the above-mentioned size.

I had no question, from the appearance of the patient and from the examination of the tumor, but that it was of a malignant character. I did not encourage its removal, as it involved a loss of skin and a large portion of the muscle, and a dissection from the bone, with every probability of recurrence. The patient was much averse to an operation, unless I could promise him a perfect certainty of cure from it. I advised him some constitutional remedies to invigorate his health, and especially to avoid having the tumor handled or disturbed, as I have often seen the growth of tumors accelerated by repeated manipulations.

Within a few days of writing this, a gentleman stopped me in the street to thank me for the advice I had given him, and recalled his case to me. He said that, shortly after consulting me, the tumor began gradually to disappear, and finally was entirely absorbed. On examining the spot occupied by it, I found the

upper part of the sterno-mastoid muscle slightly bulbous, as if inflated with air. The part, however, was perfectly soft, and not the slightest trace of the tumor remained.

CASE CCLXXXVII. — *Tumor of the Face and Orbit. Recovery.* — The patient was 40 years old. Fifteen years before, a small pimple, followed by a scale, appeared on his face, below the eyelid. This was kept sore and irritated by being constantly picked. It slowly increased, invading the integuments of the face, cellular membrane, muscles, and apparently the malar bone, and taking partial possession of the orbit, so as to force the eye backward and upward, and in a great measure conceal it. The tumor appeared perfectly fixed, as if involving the malar and other bones of the orbit; and the operation was done after stating to the patient the uncertainty of the result, of which he seemed fully aware, and with the expectation of the necessity of removing the malar bone and the obitar process of the superior maxillary.

The tumor on the face being circumscribed by an incision, and the dissection commenced, it was found possible, while using the chisel to examine the state of the bone, to peel up the tumor with it from the base without removing any of the bone itself. The disease evidently had taken hold of the covering of the bone, but had not penetrated its structure. With much difficulty and patient dissection, the whole periosteum of the malar bone, with the tumor attached, was removed, and the dissection carried deeply into the orbit, removing the disease there in the same way; the whole mass coming out perfectly clean and smooth. The edge of the eyelid and the mucous membrane were left; and the sight was not injured, although the eyeball had been much compressed and forced from its natural position.

A microscopical examination of the disease, afterward, by Dr. Ellis, revealed a structure composed of much fibrous tissue; but no cancer-cells could be detected. The patient recovered well after the operation.

CASE CCLXXXVIII. — *Recurrent Tumor in Cheek, with Erectile Tissue. Removal. Recovery.* — A young gentle-

man from Halifax, N.S., 16 years old, came under my care in January, 1847, for a tumor situated in the substance of the right cheek. One of a similar nature had been removed from the same situation two years before, but had speedily returned.

When I saw him, the whole of the right side of his face looked larger than the left. The veins were much distended; and, at first sight, a malignant disease of the antrum would have been suspected. A lobulated tumor was found deeply seated in the substance of the cheek, just below the zygomatic arch, and apparently extended up under it. It was movable and hard. A large vascular polypoid growth occupied the right nostril, and entirely obstructed the breathing on that side.

In consultation, it was determined to remove the tumor, which was done on Jan. 28th. This was one of the early cases of the use of ether, which was exhibited by Dr. Morton with his inhaler; and, in four minutes, the patient was quite insensible. The polypoid growth in the nose was first removed. A transverse incision was then made along the lower edge of the zygoma; the skin and muscular substance cut through, which exposed an erectile tissue entirely enveloping the tumor, and intimately connected with the surrounding parts. In dividing this, in order to arrive at the body of the tumor, a hemorrhage began, which greatly obscured the dissection; and it was only by compressing the carotid that the operation could be continued. The tumor was now discovered extending up under the zygomatic arch, but only attached there by a loose cellular tissue; behind, it dipped down in the direction of the sphenomaxillary fissure. It was detached from these different connections after a long dissection. The operation was suspended from time to time, in order to allow the repetition of the ether, which was three times repeated, at the request of the patient. He said subsequently, that he had experienced no pain, and that his impressions were agreeable. His call for ether, he said, was partly from the pleasure of taking it, and not entirely on account of the relief it afforded him from suffering.

In consequence of the great hemorrhage from the whole surface of the wound, it was found necessary to use compression

with sponges. No subsequent bleeding took place, and the patient recovered without any bad symptom. One or two weeks elapsed, however, before the sponges could be extricated from the deep wound, so firmly were they embraced by the granulations; and at length removal was only accomplished by tearing them away piecemeal. The disease appeared to be of an encephaloid character, and entirely surrounded by erectile tissue, the division of which gave rise to the hemorrhage. With the exception of the actual cautery, the use of sponges seemed to me the only means of stopping the flow of blood; and from the great difficulty in removing these from the wound, I think, that, in a similar case, I should give the preference to the former.

Notwithstanding the malignant appearance of the tumor, the patient entirely recovered; and I saw him some years afterward, grown to robust manhood, with a marked evidence on his face of the severity of the operations he had undergone.

This disease was doubtless a polypoid growth, invested by erectile tissue. The question of its malignancy was settled by its not recurring. I have seen one instance of a similar growth which had made its way out from the posterior nares into the zygomatic fossa, probably by absorption of the superior maxillary bone; a part of it appearing in the nostril of the affected side.

LEUCOCYTHÆMIA.

This subject has been already alluded to in the introduction to this chapter. Its history has been well illustrated by Dr. H. F. Damon of this city, in his "Prize Essay" published in 1864. An excellent paper on the "Policy or Impolicy of removing Leucocythæmic, Glandular Tumors," by Dr. D. W. Cheever, was published in the Boston "Medical and Surgical Journal" for Aug. 2, 1866.

I have had two or three cases of leucocythæmic growths, where the tumors were so extensive—occupying one or both sides of the neck—that an operation seemed unadvisable. These cases, of which the following is an example, have been much benefited

by the use of iron, sea-bathing, a highly nourishing diet, and the other means usually employed in patients called scrofulous, or of other diseases of low vitality.

CASE CCLXXXIX. — *Tumor of Neck.* — A young woman, 18 years of age, with scanty menstruation, and always of a delicate constitution, four years before I saw her had a small tumor appear in the neck, under the left ear. This, for about two years, seemed to increase and diminish at intervals. At the end of this time, the tumor began to grow larger; and others were added to it, until the whole side of the neck, from the ear to the clavicle, was filled with large, soft, and easily moved tumors. These, upon any excitement, became enlarged, and tightly distended with blood. The patient was moderately fleshy, but had a livid, unhealthy look; was troubled with palpitation of the heart, and debility; also shortness of breath on slight exertion. She suffered no pain in the tumor, which seemed to dip deeply into the neck, and overhang the clavicle; but she had neuralgia in the left arm, which was somewhat swollen. Her general health was improved by a tonic course of treatment, but the tumor did not diminish in size.

CASE CCXC. — *Tumor of Neck. Operation. Internal Jugular Vein cut and tied. Recovery.* — A gentleman, 37 years of age, applied to me in May, 1861, for an ulcerated tumor on the left side of the neck, occupying the greater portion of the region between the outer part of the sterno-mastoid muscle and the trachea. A tumor of three years' growth had been removed from this spot in May, 1859. The sheath of the great vessels had been exposed, and the mass separated at that point, the pedicle apparently extending in between them nearly to the cervical vertebræ: a ligature was tied around this pedicle before the mass was cut off. The tumor was of an encysted character, and contained a thick fluid. The wound healed well, but shortly afterward the tumor began to re-appear.

When he consulted me, it not only occupied a good part of the left side of the neck, but pressed back into the throat and on the trachea, impeding deglutition and respiration. Although I was

extremely unwilling to operate, yet, at the urgent solicitation of the patient to make an effort to save his life, I consented. The tumor was encircled by an incision extending along the lower edge of the jaw; another in front of the tumor, between it and the trachea; one below, in a line with the clavicle; and a fourth in a line with the sterno-mastoid. The operation required a long and laborious dissection of nearly two hours. In dissecting the tumor from the great vessels, the internal jugular — which was partially incorporated with it — had a piece necessarily cut out from its side. The aperture in the vessel being seized with two forceps, a ligature closed the aperture. The tumor, which was of a dumb-bell shape, expanded behind the great vessels; and that portion which pressed up the mucous membrane of the pharynx, and could be seen in the mouth, was removed without any great difficulty, no inflammatory adhesions binding it.

The patient supported the operation well, being seated in a chair, and under the influence of ether for over two hours. The symptoms that followed were not any more violent than could have been expected from such an operation. He was kept extremely quiet for a number of days, for fear of hemorrhage from the jugular. There was much soreness of the throat, and some affection of his voice. But he recovered rapidly, and was well enough to return home to another State on the 28th of May, about three weeks after the operation.

Dr. Calvin G. Ellis kindly gave me the following microscopic appearances of a portion of the tumor sent him: —

“The growth was about three inches in diameter, and composed of small lobules, clusters of which appeared to be contained in cysts, which they quite filled. The color of these lobules varied with the number of bloodvessels contained within them; some being nearly white, while others were of a deep-red color. These vessels, after reaching the periphery of the lobule, returned in the form of loops. The lobules were composed of delicate fibrous tissue, with small nuclei, with, for the most part, comparatively small nucleoli. In some parts, these nuclei were quite irregular in form.”

One or two years afterwards, this patient consulted me for a recurrence of this disease, for which no operation was avail-

able. His general health, since the operation, had been quite good.

CASE CCXCI. — *Large Tumor of Face and Neck. Removal. Recovery. Recurrence after three years. Operation. Death.* — Feb. 12, 1848. A man, aged 47, applied to me with a tumor of two years' standing, occupying a good part of the left side of the neck. It began as a movable tumor near the angle of the jaw, and increased until it extended from the condyle of the jaw to within an inch of the clavicle underneath the sterno-mastoid muscle, and beyond the median line of the neck, forcing the trachea before it, and encroached upon the mouth, pushing the tongue over to the right side. The carotid artery was lost in the tumor. At a consultation, it was decided that an effort to remove the tumor should be made, although the entire extirpation of it was considered as doubtful. The patient being placed under the influence of ether, the removal was effected, after a long and careful dissection; that portion of the tumor which projected into the mouth being enucleated without any difficulty. The carotid artery and jugular vein were buried in a deep fissure on the lower part of the tumor. After its removal, the anatomy of the whole neck was beautifully displayed, particularly the small muscles under the jaw, and the nerves of that part. The patient recovered rapidly, and, after a few weeks, left the Hospital well. The tumor had a solid base, with an innumerable quantity of cysts, which pervaded its substance and covered its surface. I saw nothing of this man, until two years afterwards. He then had, in the middle of his neck, under the skin, a small movable tumor, about the size of a nut, which could be taken up between the fingers, and might have been easily removed by a few strokes of the knife: he, however, declined to have it done. I lost sight of him until the spring of 1851, when I was called to see him, and found him in the following condition: The entire left side of the neck, together with the front part, as far as the clavicle and sternum, was occupied by an enormous tumor, covered with large veins, and extending up into his mouth. One part of the surface had ulcerated; and, from this place, there had been

repeated and severe hemorrhages. He thought he had lost, once or twice, nearly a quart of blood; but this was probably exaggerated.

Under treatment, the bleeding was momentarily stayed; but, recurring again, and threatening his life, he was finally induced to be removed to the Hospital, where he could be carefully watched, and means instantly used on the return of the hemorrhage. After a few days' treatment, he revived a little; and, on a full consultation of the surgeons of the Hospital, it was decided to inform the patient, that, if he chose to have an operation done, it was barely possible that his life might be saved. To this he at once consented. The following day, his strength having revived a little, sufficient to allow of an attempt to remove the tumor, it was done as follows, under ether. The account is condensed from the Hospital records: An incision, more than a foot long, was made over the tumor, through the skin, from the mastoid process to the opposite side of the neck. The tumor was now partly dissected, and partly enucleated with the fingers where it passed under the tongue. The principal adhesions were in the vicinity of the great vessels; from the sheath of which the tumor had in the first operation been dissected, and which had since become completely incorporated with it. There was no difficulty in dissecting out the carotid; but this was not so with regard to the jugular, which was involved in a mass of inflammatory material, and its outlines with difficulty distinguished. This vein was wounded, and the opening into it followed by a great gush of blood. It was at once seized, and tied on the side. The hemorrhage elsewhere was principally venous, coming from the large veins which everywhere covered the surface of the tumor. The whole time occupied in sweeping out—if it can be so called—this great mass, was but a few minutes; as, after the first incisions, every moment of time that could be saved was precious: the surface being so extensive, it was useless to stop to tie vessels.

On the completion of the operation, the patient fainted; but soon revived, on taking a few drops of the spirits of ammonia. The wound being closed and dressed, he was carried to his bed, and seemed pretty comfortable. Towards evening, he had a

return of collapse, and died suddenly. He had, in the most determined manner, refused — after the operation, and also before it — the use of diffusible stimulants, from having taken the pledge against intoxicating drinks. Substitutes were used, but ineffectually; and it is doubtful whether any thing would have altered the result.

CASE CCXCII. — *Large Encysted Thyroid Tumor of the Neck. Incision. Recovery.* — A hale, hearty old lady, aged 56, entered the Hospital on June 11, 1860, with a large tumor occupying the whole front of the neck, extending from the chin to the sternum, projecting out beyond the chin in front. It was evidently a sac, but so distended that at first it might easily be mistaken for a solid tumor. It began in the middle of the neck, when she was only two years of age, and increased slowly until June, 1859. Since then, it had nearly doubled in size. The skin over it was red, but moved freely on the subjacent parts. It was not translucent, and no fluctuation could be felt in it. There was no anæmia. She complained of fulness in the head, apparently owing to the obstruction of blood from pressure on the great vessels. On the 13th of June, I punctured the tumor with a small trocar, and drew off twelve ounces of dark, thin, chocolate-colored fluid. The canula was left in the wound; but it escaped in the night, owing to the want of apposition between the wound in the skin and the sac, after the escape of the fluid. I did not make an incision into the tumor at this time, wishing first to test the hemorrhagic tendency in it; as I had once or twice before observed, in these cases, that, after the pressure of the fluid was taken off from the internal part of the sac, a troublesome bleeding took place from the erectile tissue pervading it. On the 20th of June, I made a free incision into the tumor, on the median line, and evacuated several ounces of bloody serum. A tent was then introduced, and retained in position by adhesive plaster. On the 21st, the patient was comfortable, but had a slight sensation of giddiness. The discharge was of a purulent nature, and gradually increased, from day to day, in quantity, becoming very offensive; so that on June 30th, finding her suffering from great prostration and diar-

rhœa, I again freely incised the sac, and covered it with a large poultice. She was then put upon a course of quinine. On the 2d of July, there was considerable hemorrhage from the wound, which was checked by exposure to the air. On the following day, another slight hemorrhage took place, and a third one on the 6th July. Suppuration was free from the sac, and of a natural consistency. After this time she improved, and, on July 10th, was advised to leave the Hospital, and go into the country. I did not hear from this patient again until Nov. 24th, when her physician wrote me "that the tumor had entirely disappeared, and the wound healed up."

CASE CCXCIII. — *Thyroid Tumor. Twice removed.* — A woman, 35 years of age, noticed, in October, 1849, a small swelling in the neck on the right side of the trachea. In November, 1851, this having become very painful, I removed it, after a long and careful dissection. It proved to be a cyst in the right lobe of the thyroid gland. Four months after, another tumor appeared in the same situation, and slowly increased until May, 1858, when it was the size of an apple. It was fluctuating, and unaccompanied by pain; but respiration was impeded by its pressing on the larynx.

The patient being etherized, a vertical incision was made over the tumor down to the sac, which was then laid open. About eight ounces of a dark-brown fluid escaped. Considerable hemorrhage ensued from the interior of the sac, proceeding from vessels which it was found impossible to secure. A strong ligature was therefore applied to the mouth of the sac, and the patient removed to her bed. It was found that the sac occupied the position of the right lobe of the thyroid gland.

The sac at once filled again, and the ligature which confined the mouth of it threatened to give way, but fortunately did not until suppuration took place. For five days after the operation, there were repeated hemorrhages from the superficial vessels, which were greatly engorged, and which were checked by the application of a solution of the perchloride of iron. The suppurative process obliterated the sac, and she was discharged permanently cured in four weeks, and I have seen her frequently since, in good health.

Thyroid tumors, as surgeons well know, are always troublesome to deal with. The treatment by seton is not unattended with danger, and I have seen serious hemorrhages result from its use. In one patient, a very marked protrusion of the eyes (exophthalmos) co-existed with it, accompanied by an anæmic condition and some cerebral disturbance. This patient urgently desired an operation, but I did not see the way clear to justify me in interfering with the tumor. The treatment of these tumors, whether solid or encysted, with the long-continued internal or external use of iodine, requires judgment and caution.

CASE CCXCIV. — *Tumor of the Neck, involving the Axillary Plexus of Nerves. Removal.* — A woman, 40 years of age, applied to me in October, 1865, for a peculiar-looking tumor of the neck, of thirteen years' standing. Some time before, she had been run over. A horse struck her with his head, knocking her down, and the wheel of a carriage passed over her shoulder. Shortly after the accident, a small hard tumor appeared, above the left clavicle, very near the acromion. This continued to grow until it attained the size of a goose-egg. It produced much pain in her arm, and partially paralyzed it. It lay very deep in the outer triangle of the neck, was a little movable, and slightly fluctuating on pressure.

In order to remove it, a crucial incision was made so as to freely expose the tumor. This was composed of a thick sac, which was partially embraced by filaments and nerves of the brachial plexus. By a very careful dissection, the nerves were gradually detached from the tumor, and the sac dissected out, leaving the brachial plexus exposed. The hemorrhage was quite free, and some large vessels required the ligature.

The sac contained a turbid, serous fluid. In the inflammatory process which ensued for the reparation of the wound, the pain in the arm was temporarily aggravated, accompanied with cramps in the thumb, index and middle fingers.

She gradually recovered, and was discharged in about three weeks. I saw her some months afterward, and prescribed for her a number of times; the power in the arm becoming gradually restored after the removal of the tumor.

The exact way in which the passage of the wheel over the shoulder caused the tumor is difficult to explain, except that it was by some effusion of blood at the time, under the fascia.

CASE CCXCV. — *Hydrocele of the Neck. Inflammation. Suppuration. Removal of Sac.* — A young man, 28 years of age, had, for a year, a tumor in the lower triangle of the neck. It commenced quite small, just above the clavicle. When I first saw him, it had increased so as to occupy nearly the whole of one side of the neck; extending from the clavicle to the mastoid process, and from the trachea, underneath the sterno-mastoid muscle, to the back of the neck. It caused him much pain, and, from the pressure on the trachea, difficulty of respiration. By my direction, he entered the Hospital for treatment. Shortly after, it suddenly became tense and painful, and the spot on its surface red; showing indications of suppuration. It was therefore opened, and a great quantity of sero-purulent matter discharged. It had once before been opened, and a quantity of milky serum evacuated.

The tumor now gradually contracted, and the patient had much relief. At the end of about three weeks, it had contracted to the size of a large apple, and it was determined to attempt to remove it.

The dissection was very long and laborious, implicating most of the large bloodvessels and nerves of the neck; the inflammation, which had taken place in the sac, having glued it to the surrounding parts. A symptom which occurred during its removal is worthy of notice, which I have observed before in removing important tumors involving the nerves of the neck. Whenever the tumor was dragged upon, respiration was so much affected that it was necessary to suspend the operation for a time.

He remained quite depressed for an hour after the operation, although he lost but little blood. The recovery, however, was good.

CASE CCXCVI. — *Cystic Tumor of Breast. Removal.* — April, 1866. A stout, healthy-looking German woman, 45

years of age, entered the Hospital for a tumor of the breast, of which she gave the following history : Eighteen years before, after her first confinement, she applied a puppy to her breast to draw off the milk. Instead of drawing off the milk, he bit off the nipple so completely that the milk could not be drawn at all. Soon after, the breast began to swell ; and, at the end of three months, broke.

After this had healed, a small hard bunch was noticed in the substance of the gland, inside of the position of the nipple. With the birth of each one of her children subsequently, she had a similar abscess in the breast ; and the tumor slowly increased in size. During this period, her general health remained very good ; and she suffered no pain in the breast, except at the time when it was distended with milk, and broken. In the early part of March, 1866, after exposure to severe weather, the breast became swollen ; and, to relieve it, she applied, by the advice of an old woman, a strong caustic preparation, which was kept on until three days before coming to the Hospital.

On entrance, the breast presented the following appearances : It was very much enlarged, and the skin denuded for a space of six inches in circumference in the centre, where a pedunculated, ovoid, bleeding mass, the size of an orange, protruded. Inside of this, covered by the skin, a hard lump, the size of a hen's egg, could be felt. The patient stated, that a small mass, attached to the larger one, had sloughed away five days before. She had no pain at any time, except from the use of the caustic. The skin of the gland, outside of the denuded portion, was not discolored.

The patient being etherized, the tumors, with the surrounding gland-tissue, were removed. Very slight hemorrhage ensued, requiring four ligatures. The tumors were found to be composed of proliferous cysts.

The wound united almost by the first intention ; and the patient left the Hospital, well, in the course of a few weeks.

CASE CCXCVII.—*Erectile Tumor of Breast. Removal.*
—July, 1862, a healthy woman, 47 years of age, entered the

Hospital for a tumor of the breast. It appeared, two years before, as a small, hard, painless lump in the right breast, near the nipple, and increased in size slowly. In June, 1862, after an examination, pain was first felt; and for the following month there were, at times, severe lancinating pains in the breast, which was about double the natural size, and moderately hard on pressure.

The patient was etherized, and the hardness entirely subsided. An exploratory incision was then made over the tumor; and, after dissecting through the skin and adipose tissue, a dark-blue substance was found, which proved to be a mass of dilated veins, about the size of the little finger. The rest of the tumor was then carefully dissected out, and found to be of an erectile character, occupying the entire gland. The whole mass was removed, a few small arteries requiring ligature. The patient made a rapid recovery.

CASE CCXCVIII. — *Chronic Inflammation of the Breast, resembling Scirrhus. Removal.* — A woman, born in England, apparently of Jewish origin, applied to me in January, 1861, for a tumor of the right breast, which, to the touch, gave the ordinary sensation of scirrhus. Her physician, a distinguished practitioner in a neighboring town, had examined it, and advised its removal. She was twenty-five years of age; with an extremely delicate and transparent skin. Her health had generally been good. She had been twice confined, and had had one or two miscarriages; but, although well developed in every respect, never had any milk. Nine months before, she was confined, when a swelling took place of both breasts, but without any milk in either. The right breast suppurated, and was opened in two or three places: it remained in a sore state for two months, when it healed, leaving an induration. This enlarged from that time, and became more and more troublesome.

A tumor of the size of a small potato was discovered in the axillary side of the breast. It was quite movable: the skin over it was retracted, and adherent in one or two places; the nipple so deeply drawn in as to have entirely disappeared. The tumor

could not be distinguished from scirrhus: still, the history of the case and age of the patient seemed against it; but as the breast was entirely useless, and as it was the source of great irritation to her, I advised its removal.

The tumor was removed, together with the nipple and adherent skin. The body of the tumor was composed of a transparent fibrous tissue, which creaked under the scalpel. Near the surface was an abscess, about the size of a cherry, filled with unhealthy looking pus. Although, when exposed, the tumor still gave to the finger the sensation of scirrhus, yet, on examination with the microscope, no cancer-cells could be found in it.

The patient had a good recovery, and was seen, in March, 1862, in a state of perfect health.

CASE CCXCIX. — *Cancer of the Breast. Removal.* — On the 27th December, 1861, I operated on the following case: The lady was 40 years of age, unmarried, and very delicate. One or two of her family had died of cancer of the uterus, and one now has a cancer of the breast. She perceived the tumor on the axillary side of the left breast four years before; it then being quite small and movable. One year before, it enlarged, adhered to the skin; and was just on the point of ulceration when I operated. She had pain in the tumor, and in the arm of that side. I removed the tumor, the mammary gland to which it was attached, and the skin over it. The wound was approximated by sutures and adhesive straps, and a bandage applied.

On cutting open the tumor, it was found to be a scirrhus lump, involving the edge of the mammary gland; the skin over it being destroyed and the edges of the skin incorporated with it. The wound healed well. A slight irritation, and exudation from the surface of the scar, however, continued for some months. She then improved in health, and now, at the end of five years, is perfectly well.

CASE CCC. — *Cancer of the Breast, following immediately on Nursing. Palliative Operation, with Recurrence of Disease.* — A lady was brought to me by her physician, with a scirrhus enlargement of the left breast; the skin being

covered with cancerous tubercles. There was also a slight enlargement of the glands in the axilla. The tumor was quite painful, as was the arm of the same side, and sleep interfered with from this cause. There was also a slight cough. She was a small, rather delicate woman, forty-five years old, and the mother of eight children; the disease having appeared about four months before, immediately after weaning the last child. The operation for its removal was performed on the 7th of December, 1861. The breast, with the skin over it, and the diseased gland in the axilla, being removed, sufficient integument remained to allow of the approximation of the edges of the wound. The hemorrhage was considerable, as is the case in most of these tumors of an active growth. As the woman was thin, I determined to make an attempt for union by the first intention: the edges of the wound were therefore nicely approximated by means of sutures and plaster. For the first two or three days, she had a febrile action, apparently depending, in a great measure, on the effect of the ether.

The wound united, almost by the first intention: a part of the skin, however, in its centre, where the traction was the greatest, sloughed. About the tenth day, she was able to sit up and take solid food, and on the fourteenth was able to go out for a short walk. Shortly after, she left the Hospital with her wound nearly healed, the pain relieved, and her cough entirely gone.

I saw her again a few months after, with a recurrence of the disease in the cicatrix. I should have stated before, that I had informed the patient's friends, previous to the first operation, that cancer occurring in this way, either during or immediately after nursing, is generally of the most unfavorable description, and is almost certain to recur: if, however, they chose to have an operation performed, to relieve her sufferings and to give her a temporary respite, I saw no objection. The operation did have this effect, and also relieved her cough. Her health had been quite good after the healing of the wound. I did not advise a repetition of the operation, as I should have done under other circumstances.

CASE CCCI. — *Cancer of Breast while Nursing. Removal.* — A lady, 26 years of age, of good shape, and always healthy, was delivered of her first child in 1859. In August, 1860, she perceived that her right breast was swollen, but continued to nurse, and in January applied to me with an infiltrated cancer of the whole of the gland. It did not then give her much pain, but her health was failing. I advised weaning her child at once. Subsequently, she came to me again, with the disease in an advanced state of development. The whole breast was solid, and might well be called scirrhus. The skin was covered with cancerous tubercles: there was an enlarged gland under the axilla. The pain in it was excessive, of a burning, stinging character, and darting up through the nerves of the shoulder-joint. She was very desirous of having the disease removed, and I finally agreed to do it, in order to give her a temporary relief; at the same time, making her fully understand that that was all she could expect from it. When it came to the operation, her courage failed, and she determined to abandon the idea of having it removed. I did not see her again for two or three weeks, when she called on me, and said that the pain had become so intense, and of such a burning, grinding character, as to deprive her of sleep, and render life intolerable. She begged, therefore, to have the operation done; otherwise, she feared that she should die from excessive pain. The whole substance of the breast, together with the skin, was of the most excessive hardness: it appeared solidly adherent to the ribs. The patient had a bluish and almost asphyxiated look, but was still in tolerable flesh, and was pretty strong. She was fully etherized, and the whole tumor encircled by an incision. A little dissection was now made under the lower edge of the mass, so as to afford a good hold upon it: and the separation was completed, partly by tearing, and partly by the handle of the knife and the fingers; this being considered the more effectual way of getting rid of the diseased tissue. The surface exposed was about the size of a common dinner-plate. The bleeding after the operation was not excessive; but, while engaged in taking up the vessels which required ligatures, the pulse failed, and the patient was seen to

be in a state of collapse, requiring the application of ammonia to the nostrils, frictions, &c., under which treatment she revived. I have once or twice observed this condition, when extensive wounds over the region of the heart have been exposed to the air. In the present instance, these same symptoms recurred as soon as the whole surface of the wound was again exposed. The remaining vessels were therefore secured, taking care to uncover only a small surface of the wound at a time. In the subsequent dressings, instead of using cerate, flour was applied to the whole surface, which was removed from day to day, as appeared to be required. This method I have frequently adopted in dressing very large wounds resulting from the removal of the breast, when it is important to avoid the daily exposure of the surface in dressing. The secretions are absorbed by the flour; and the small masses thus formed roll off from the wound, and can be easily removed, and replaced by fresh applications. She was at once relieved by the operation, and was placed in a state of comfort, when compared with her previous condition of torment. It required three or four weeks for her to recover so as to be able to go home. The wound was then two-thirds healed. I never heard from her afterward, but have no doubt that the disease returned.

CASE CCCII. — *Cancer of the Breast. Operation. Re-appearance of Cancer in other parts of the Body. Repeated Operation.* — A lady, 45 years of age, of fine development, who had always enjoyed good health, called on me in June, 1858, with a tumor in the right breast, of a year's standing. It was evidently scirrhus, and was rapidly approaching the surface. I removed the whole breast. The tumor being large, many ligatures were required: the wound healed kindly, with the exception of one spot, where there was much irritation, which, after five or six weeks, almost gave rise to the idea that there was a recurrence of the disease; but this was finally relieved by the discharge of the knot of a ligature. In October, 1859, I was called to see her, to examine a large, hard, scirrhus mass in the axilla of the same side, of the size of a double fist, quite movable, but evidently implicating the nerves and the axillary

artery. I advised an operation, and, after making the external incisions, removed the disease principally by enucleation with the fingers; exposing all the great nerves, artery, and veins in the axilla. The patient remained quite well until August, 1860, when, after much fatigue from travelling, an ulceration occurred in the axilla, which I at first feared was a return of the disease, but which healed up kindly, leaving no induration. January, 1861, I was requested to see her on account of a swelling partly over the spinous process of one of the dorsal vertebræ. I at once detected a scirrhus lump there. She, at this time, was complaining of neuralgic pains in the left shoulder and axilla. The cicatrix of the breast and axilla was perfectly sound. The tumor at first seemed quite indefinite, but gradually, after some weeks, became defined; and, at her request, I proceeded to remove it. The disease seemed almost confined to the fascia over the vertebræ, and came out in a solid disc of about the size of a dollar. It was about an inch thick in the centre, and tapered off towards the edges: the skin was not implicated; and, after the removal of the diseased mass, the surrounding parts were found to be quite healthy. The wound healed well, and there was no return of the disease locally. On the 11th of December, 1861, after complaining for two or three weeks of a sense of numbness, attended with neuralgic pains in the muscles of the thighs, together with a partial paralysis of the flexor muscles of the right thigh, she was seized with an epileptic convulsion, which lasted between one and two hours, in the course of which the right thigh was broken near its upper third. The cerebral irritation subsided during the course of the night, so that on the next day but little evidence of it remained. She did not, however, for a week after, complain of her broken thigh. I did not think it worth while to apply any apparatus to the limb, and she did not discover what had occurred, but simply placed it on a pillow; in which position, with the toes a little everted, it united in a couple of months. During this period, she had two or three epileptic attacks, whose violence was mitigated by the inhalation of ether. On the 7th of March, 1862, she had an attack which lasted the greater part of the night, leaving her mind in a wandering

state, in which condition she remained at the date of the present record (March 11th), recognizing friends with a smile, but suffering from an entire loss of memory. She has now a cancerous tubercle under the skin, over the right scapula, and a cancerous mass in front of the left scapula, on the back. During the whole of this long period, she has never had the slightest pain, and has submitted to the various operations with fortitude and resignation, and, in fact, was never aware of the exact nature of her disease.

She sank shortly after, and died without suffering.

CASE CCCIII. — *Recurrent Cancer. Long-continued Secretion of Milk.* — I was requested in February, 1851, to see a woman, 64 years of age, from whom I had removed the left breast ten years before, for a cancerous tumor of two years' standing. She was then a widow, and her youngest child was 35 years old. After weaning this child, she had milk in the breast which afterwards became diseased, for three years. She had remained well after the first operation until 1850, when two lumps appeared, one over the pectoral muscle, and one in the axilla; the former being adherent to the skin, and had been tampered with by caustics. These tumors were thoroughly removed.

I saw her a year afterwards, in a good state of health, and with no return of cancer.

This patient had been subject, for many years, to obstinate constipation, often going sixteen days without an action of the bowels. This condition had lately been completely relieved by the use of a glass of wine daily, with a small quantity of the sulphate of magnesia in it.

CASE CCCIV. — *Cancer of the Breast. Long-continued Secretion of Milk.* — In 1852, I operated on a woman, 60 years of age, to remove a small cancerous tumor of the right breast, of a year and a half standing. This patient had continued to have milk in both breasts since the birth of her first child, thirty-seven years before. Her mother had died of cancer of the breast, and one of her sisters of a cancerous ulceration of the nose.

In another instance, I removed a cancerous breast, in which the milk had been retained on that side for twenty years.

CASE CCCV. — *Tumor of Male Breast. Removal. Recovery.* — A man, 63 years of age, entered the Hospital, June 16, 1865, who, about four months before, had noticed a small, hard tumor, above and to the outside of the right nipple. For the first month after its appearance, the only sensation in it was one of itching. It afterwards rapidly increased in size, becoming softer, and at times painful. It was about the size of an egg, circumscribed and movable: there were no external signs of inflammatory action. He had generally been healthy.

About fifteen years before, Dr. J. C. Warren removed a cancer from his right lower eyelid. He said that an uncle of his had a large cancer on his lip, which destroyed him.

The patient being placed under ether, the tumor was removed by two elliptical incisions. On examination by the microscope, it proved not to be malignant, but consisted of a hypertrophied glandular structure. The patient did well, the wound healing up very rapidly.

CASE CCCVI. — *Remarkable Tumor in the Axilla, coming on after Nursing.* — A delicate lady, about 30 years of age, after the birth of her second child, had a tumor, one and a quarter inches wide, and three inches long, appear in each axillary region as soon as the milk began to be secreted in the breasts. These were oblong, flabby, and not unlike the breast itself in a flaccid state, but without any thing corresponding to a nipple, and were especially enlarged during lactation. On the milk drying up, the tumors disappeared in a great measure, leaving, however, distinct rudiments in their site. At her next confinement, she was delivered of a stillborn child. The secretion of milk which ensued was attended with similar phenomena in the axillæ, the swelling being much greater on the right side than on the left. In addition, on the right side, a small, hard, light-gray tumor, of the size of a pea, formed upon the apex of the swelling. This soon became the seat of the most intolerable lancinating pains, particularly at the menstrual periods, attended

with a sympathetic affection of the other axilla, and similar pains of a severe character in the region of both ovaries. My friend, Dr. Charles G. Putnam, her physician, who has had a very extensive experience in affections connected with pregnancy, had never seen any thing similar to this ; and he requested me to visit the case with him in consultation, thinking that possibly it might be one of the painful subcutaneous tubercles which are often so much aggravated during or preceding the puerperal state. The whole tumor seemed to be composed, first, of the flabby skin ; then of a collection of glands, so soft as scarcely to be distinguished from the cellular tissue ; and, implanted in the apex, the small, hard, and painful tubercle just referred to. From my experience of the painful subcutaneous tubercle, often found in the extremities, I was confident that this tumor was not of that character, and determined to make an incision in it. When this was done, a quantity of milky fluid was projected with violence a distance of several feet, and the tumor wholly subsided. On the following day, she was entirely free from pain.

From that time, the neuralgic condition of different parts of the body, which seemed to emanate from this small cyst on the apex of the axillary tumor, ceased ; and she very rapidly recovered her health.

CASE CCCVII. — *Large Tumor of the Arm* (see woodcut). This old lady, 75 years of age, informed me that, twenty years before, her husband, while in a state of insanity, threw at her a *cannon-ball*, which hit her on the arm, near the axilla. Shortly afterward, the tumor began to make its appearance, and increased until it attained an enormous size. It appeared to be of a fibro-cellular character, and of about twenty pounds weight ; hanging down so that, when the arm was held at a right angle with the body, it rested on the seat on which she sat, dragging down the integuments and other structures in its vicinity. Very large vessels entered it from the axilla, and could be distinguished pulsating in its substance. The tumor was carried by the patient in a large sleeve ; and, when I saw it first, it had an ulceration on the surface, caused by being projected from her sleeve upon the grate, while she was throwing coals upon the fire. She



had a second tumor, apparently of a similar description, on her face.

A very striking daguerrotype was taken of this patient and the tumor.

From some superstitious feeling connected with its removal, she declined having it operated on; and it is principally from the manner of its occurrence, its apparent structure, and its uncommon size in this situation, that I have thought it worth while to relate it, and have it depicted.

CASE CCCVIII. — *Enchondroma of the First Phalanx of the Middle Finger. Amputation.* — May, 1850. The subject of the disease was a girl, 13 years old. When two years of age, a small, hard swelling appeared on the inner side of the

first phalanx of the middle finger. This slowly increased, and produced no inconvenience, except from its size, which more or less interfered with the motion of the hand.

At the time of the operation, the tumor was the size of a small apple, involving the whole bone of the first phalanx, and part of the second. The finger was forced out of its place, and lay diagonally across the little and ring finger. A small tumor of similar description occupied the lower phalanx of the forefinger. On the ring-finger was another, a still smaller one, lying under and concealed by the larger tumor.

The finger was removed, and the head of the metacarpal bone sawed off to allow of the necessary approximation of the edges of the wound.

A section of the excised part showed a uniform appearance, like the interior of a ripe apple. The periphery was somewhat elastic, like the more delicate layer of bone or cartilage. A few spiculæ of bone were interspersed through the interior. The shaft of the bone had disappeared. The metacarpal extremity remained.

CASE CCCIX. — *Case of large Adipose Tumor between the Thumb and Forefinger.* — A woman, 73 years of age, entered the Hospital, April 6, 1865, for a tumor, the size of a billiard-ball, of thirty-five years' standing, grasped, as it were, between the thumb and forefinger of the left hand. When first noticed, it was the size of a bean, and increased until it attained the above dimensions; becoming troublesome, and preventing the use of the fingers. The skin over it was thin, dry, and wrinkled. It was easily removed, peeling off readily from the muscles, and not involving any important vessels or nerves. The wound healed well.

An adipose tumor in this situation is rare; and I remember having seen only one other, which was in a child, and surrounded the first phalanx of one of the fingers.

It had grown very rapidly, entirely enveloped the bone, was round, elastic, quite painful, and was supposed to be (after repeated examinations by experienced surgeons) malignant. An incision into it seemed to justify this opinion; and it was de-

cided to remove the finger at the joint, which was done. On examination, it proved to be an adipose tumor, surrounding and clinging tight to the bone. The pressure of the tendons and fascia over it had compressed it in such a way as to give it the appearance of a cancer when explored. Amputation, however, was the only remedy. The operation was not performed hastily, but after the patient had been under observation some time. The finger was accordingly amputated, but one vessel requiring ligature.

CASE CCCX.—*Cystic Tumor of the Head of the Tibia.*
Amputation.—A man, 33 years of age, came under my care in May, 1859. Eighteen months before, he received a severe blow on the upper part of the right fibula, producing an inflammation and swelling there. After the first symptoms had subsided, a hard swelling was discovered, which gradually increased. In March, 1859, he said that the tumor was about half the size of an apple; "that it had the elastic feel of a windgall," and seemed to him as if, with slight pressure, he could force in its walls like stiff paper. Blisters were applied to it, which inflamed its surface. In April, an issue was employed, which made an opening into it, from which was discharged about half a teacup of clear serum, followed by more or less blood.

When I first saw him, his general health was quite good. He was able to walk with some limping, the knee being very slightly bent. The upper and anterior part of the leg was occupied by a hard swelling, which entirely obscured the course of the upper third of the fibula. The surface of the tumor was covered by an inflamed skin from the application of vesicating substances, in the centre of which was a small opening, obstructed by a slough. Upon pressure on the limb, a quantity of sero-purulent matter ran out. The forefinger, being insinuated very slowly and carefully into this aperture, traversed the tumor through a mass of loose granulated substance, and brought up against the tibia, which felt quite smooth, as if covered by a serous membrane; and, the finger being swept around, encountered an elevated cup of bone. The head of the fibula was

nowhere to be discovered ; and though, at one part of the tibia, a little roughness could be detected, no loose spiculæ of bone were anywhere to be observed. The finger being withdrawn, a slow stream of venous blood followed, and continued to flow for one or two minutes.

I informed the patient of the nature of the disease, and that the only remedy was amputation, — an opinion agreed in by the other surgeons of the Hospital, who saw him on the following day. I myself rather inclined to favor the idea that the disease was what has been called *spina ventosa* ; and that the supuration of the tumor and the granulated contents were to be attributed to the inflammatory action brought on by the issue, thus giving it a malignant aspect, — an idea which some of the gentlemen favored.

In addition to what has been stated above, in regard to the use of the limb, it may be added, that the power of flexion of the foot was entirely destroyed, so that it hung loose in walking ; a fact which was explained afterwards by the entire destruction of the bodies of the muscles by the pressure of the tumor.

The operation was done on Saturday, May 14th. The patient being etherized, the tumor was first slit open, in accordance with a promise made to him ; and, the upper part of the fibula being found to be destroyed, together with the muscles in front of it, amputation was at once proceeded to. In order to obtain a long stump, the first incisions through the skin were made just over the upper edge of the patella. There was very little hemorrhage, and not more than half a dozen vessels required ligatures. Four sutures were introduced in the flaps, but not tied, and the wound left open till the afternoon.

The disease presented very curious and interesting phenomena. The skin, being dissected back, disclosed a large cavity, filled apparently with old coagula. These being removed, at the bottom were portions of the sac, of the color and consistence of that of an aneurism. The lower part of this sac was formed by the upper part of that portion of the fibula which had been left, three inches of it having been destroyed by disease. The portion alluded to was lined by a smooth membrane in its centre, expanded and rough on its edges. At the upper part of the

wound was a small piece of the head of the fibula, about the eighth of an inch in thickness, which still remained attached to the head of the tibia. The inner part of the cavity was partly formed by the tibia, covered by a smooth membrane, as stated before, and seemed to be of a somewhat flattened cup shape. The remainder of the sac in front, on the outside and elsewhere, was formed by the integuments and degenerated muscular tissue, interspersed with pieces of bone.

Some of the gentlemen who examined the limb seemed to think the disease might possibly have been an aneurismal tumor of the bone; although the want of free arterial hemorrhage, when it was opened, did not favor that idea. A careful microscopic examination, made afterwards by Dr. Ellis, threw a new light upon it, and seemed to verify the accuracy of the first diagnosis. The apparent coagula, being placed in focus, were found to consist almost entirely of myeloid structure, and the whitish-yellow substance interspersed with it, and which might easily have been taken for encephaloid matter, was found to be composed of fat globules. Mr. Paget, in his "Surgical Pathology," mentions an almost similarly deceptive case, in these words:—

"None who examined this disease with the naked eye alone felt any doubt that it was an example of medullary cancer, with cysts abundantly formed in it. But, on minuter investigation, none but the elements which I shall presently describe as characteristic of the myeloid tumors could be found in it. These, copiously embedded in a dimly granular substance, appeared to form the substance of the cyst-walls, and of whatever solid material existed between them. The white, brain-like mass was apparently composed of similar elements, in an advanced fatty degeneration: neither in it, nor in any other part, could I find a semblance of cancer-cells."

The patient recovered well; and so far as I know, had no recurrence of the disease.

CASE CCCXI. — *Encephaloid Tumor of the Head of the Right Tibia. Amputation.* — A boy, 16 years of age, of delicate complexion and light hair, was brought to me on Nov. 1, 1859, by his father. He was suffering at the time from a large

tumor, on the outside of the head of the tibia of the right leg, with an opening on its external part. The disease began five months before by a severe pain deep in the limb, which gradually increased, and at the same time the bone enlarged at that point. About five weeks before, the tumor had acquired the size of a large apple; and, the pain being very severe, they applied to a surgeon, who made a free incision into it, with partial relief for the time.

When I saw him, the limb had become contracted and useless: the pain was very severe, requiring the use of opiates, and his health was beginning to fail. I informed his parents that the only remedy was amputation, and that the disease was probably of a malignant character. The parents consented to the operation; and the patient entered the Hospital, where the operation was done on Nov. 4th.

After he was put under the influence of ether, I first made an incision into the tumor, in order to verify the diagnosis, which I found to be correct. The limb was therefore removed just above the knee.

On making a section of the tumor, the greater portion of the bony calibre of the tibia was found destroyed, and its place occupied by a large encephaloid mass, interspersed everywhere with small granules of bone, forming a disease which, under the old nomenclature, would be designated as osteosarcoma.

On the day following the operation, he was perfectly comfortable; and he made a rapid recovery.

CASE CCCXII.—*Encephaloid Tumor commencing in the Popliteal Space. Amputation. Recovery.*—A lady, 62 years of age, requested me to see her, in consultation with her physician, in August, 1853. About three years previously, being then in good health, she perceived a small tumor in the popliteal space of the left leg. This, slowly increasing, produced more or less pain, and embarrassment in the motions of the limb; and finally, when I saw her, had attained enormous dimensions, extending up on the thigh, and nearly down to the ankle. The tumor was tense, elastic, and the surface of it covered with largely dilated veins. A certain amount of pulsation was

observed in it, which at first led to the supposition that it was an aneurism; but, on careful examination, and long-continued pressure on the femoral artery, which did not at all diminish its size, I felt confident that the pulsation arose from the confinement of the tumor by the fascia over the popliteal artery, which communicated its impulse to it. The pain in it was excessive, and extended down the limb to the foot, and could be alleviated only by opiates, and was gradually wearing her out.

The decision arrived at was, that the affection was malignant, and amputation of the thigh the only remedy. In view of the slight hope of recovery to be expected from removal of the limb, the patient was at first undecided what course to pursue; but, at the end of a month, being nearly worn out by continued and increasing pain, she demanded the operation. This was performed on Sept. 24th.

The limb being removed about half-way up the thigh, and at some distance beyond the tumor, it was found that the great vessels were matted together by inflammation; and the artery, being separated and tied twice, broke through under the ligature, so that it was found necessary to plunge a needle, armed with a ligature, deeply into the muscles, and tie the artery, vein, and muscular substance in one mass.

In spite of the unfavorable nature of the operation, the patient had a good recovery, though the ligature did not come away till after the lapse of *eight* months. On dissection of the tumor, after its removal, it was found to spring from the neighborhood of the tibia, which was more or less diseased, with bony processes projecting from it. The lower part of the femur, on which the tumor lay, was more or less eroded. The body of the tumor was composed of a lardaceous looking substance, interspersed with bony spiculæ, in the centre of which was a cavity containing fibrinous clots, with walls resembling an aneurismal cavity. The popliteal artery was found in the back part of the tumor, while the nerves had been forcibly pressed from their natural position, and so dragged upon as to explain the torturing pains which had so much exhausted her. The tumor, being examined by Dr. J. B. S. Jackson, was by him pronounced malignant;

and, being examined by Dr. Shaw with the microscope, he made the following report : —

“ Composed of well-marked cancer elements, and containing a large quantity of fat in the cancer-cells. In the portion of the tumor from Dr. Jackson, which I suppose to be the same, a similar structure was found containing an enormous quantity of fat, so as to obscure the view of the cells at first sight : this portion was whiter than that which you sent me.”

Remarks. — From the malignant character of the tumor, I had but little hope of the ultimate recovery of this patient, and was much surprised on a visit to Lynn, six years afterward, at being told she was in a state of perfect health. Though I had been constantly in her vicinity before, I had not inquired after her, taking it for granted that she had succumbed to the disease. On a visit to perform an operation, two months afterward, I took occasion to call upon her. I found her in good health and spirits, and greatly increased in weight, so as to be from seventy to eighty pounds heavier than at the time of the operation. The stump I examined, and found in a perfectly healthy condition.

The case is an instructive one, as showing a good recovery and state of health at the end of six years, after an apparently desperate operation for the cure of a malignant disease.

CASE CCCXIII. — *Malignant Tumor of the Condyles of the Femur. Amputation.* — A laborer, 35 years of age, entered the Hospital on March 1st, 1859, for a swelling of the knee-joint, which he stated had been of four months' duration. It first came on after a severe blow received by the slipping of a block of ice, which struck him on the lower part of the thigh. This confined him to the house for a few days, and he was then able to limp about till nearly the time of his entrance to the Hospital. Finally, he was obliged to relinquish walking, and confine himself to the bed, on account of lameness and excessive pain in the knee-joint.

When he entered the Hospital, the whole knee-joint was occupied by a hard tumor : the leg was slightly bent on the

thigh, the lower end of the femur projecting a little forwards, as if displaced from its natural apposition with the tibia. Below, and on each side of the patella, was some elasticity; above, it was quite hard. Various applications were made to the joint; its motions were restrained by a splint; and, finally, two deep issues were applied in its neighborhood, and the surfaces sprinkled every night with half a grain of the sulphate of morphia. All these means did not have the slightest effect in mitigating the pain, and he expressed himself as unable to bear any further the excessive suffering from the disease.

A consultation of the surgeons of the Hospital being called, as is usual in such cases before proceeding to extremities, the following suggestions were made: That, from the excessive suffering, the disease might be an ulceration of the cartilages of the joint, or possibly it might be of a malignant character; and that an incision should be made into the joint, and its condition explored. If it proved to be an ulceration of the cartilage, that the ends of the bone should be removed; otherwise, amputation of the limb should at once be performed.

On being informed of the nature of the case, he agreed to have done what was thought proper. The following operation was therefore done on Wednesday, March 30th; preparation having been made beforehand of a splint, well moulded, to receive the limb in case the joint should be excised. Being etherized in his bed, to save him from the pain likely to be caused by his removal to the operating room, he was carried up stairs. A firm pillow was placed under the joint, so as to support it in a bent position; and an incision was made, commencing at the inner condyle of the femur, carried down with a semi-circular sweep over the tubercle of the tibia, and terminated opposite the outer condyle. The ligament of the patella was now cut through, and the joint partially exposed; a great rush of fluid taking place as the capsule was opened. The head of the tibia came into view in a perfectly healthy condition. The flap being raised, a most beautiful and highly colored tumor, covered with delicate synovial membrane, having large vessels running in every direction over its surface, very much distended, and formed by the lower end of the femur, was seen. The

tumor extended quite up to the top of the synovial sac. There being no question as to its malignancy, the patient was immediately slipped down upon the table, and his thigh amputated about the middle. More arteries required ligature than in ordinary cases of amputation from accident; a fact which is frequently observed, when a limb has been amputated for malignant disease. The bleeding having been checked, and the surface being quite dry, the wound was brought together with two or three sutures; and a compress, with bandage, carefully applied, to give the stump support.

In the afternoon and evening, the stump became distended and painful, so that it was necessary to open the wound again, and apply one or two ligatures. It was formerly my habit at the Hospital, in order to avoid an occurrence like the present, to leave the wound open for five or six hours, and then have the dressing done after all oozing of blood had ceased. My reason for relinquishing this practice was the excessive sensitiveness of patients for a few hours after operations, just as they recovered from the effects of ether, and their unwillingness to be interfered with. But where there is evidently much danger of bleeding, I consider the delay a lesser evil than the re-opening of the stump, searching for the bleeding vessels, and perhaps opening fresh ones, while clearing the wound from coagula, at the same time running the risk of subsequent suppuration, and sometimes of an ill-formed stump.

The patient made a good recovery.

CASE CCCXIV. — *Tumor connected with the Sartorius Muscle, secondary to Cancer of the Breast. Operation. Entrance of Air into the Vein. Recovery.* — This patient, 30 years of age, had a tumor of the breast removed five years before. One of her sisters had also been subjected to an operation of the breast for an encephaloid tumor, and was well, and present at the operation. Another sister also had a tumor of the breast.

The tumor in question appeared about a year and a half before; and, when I saw it, was four inches long and three inches wide, commencing just below Poupart's ligament, and extending down the thigh.

I was at first disinclined to advise any operation, fearing that this was a fresh demonstration of malignant disease. On further consideration, and having repeatedly examined the patient, finding no affection of the neighboring glands, or of abdominal disease, and she being very urgent to have an operation done, I finally consented to perform it. The tumor was found incorporated with the sartorius muscle, which was spread out on the back part of it. This being cut away above and below, the tumor was detached from its various adhesions. When it was lifted up, in order that the dissection might be prosecuted underneath it, on cutting the saphena vein where it pierces the fascia, a distinct sucking sound was heard, as of the air being pumped into the vein. The finger was immediately placed over the mouth of the vein, and the farther admission of air prevented. The pulse remained for some time quite weak, and the patient recovered very slowly from the ether, of which but little had been inhaled, and as readily as usual: whether this arose from the effect of the latter agent, or from the entrance of the air into the vein, cannot be readily determined. The tumor, on being laid open and examined microscopically, displayed no malignant appearances; and all the tissues in the neighborhood of it were in a healthy condition. I heard from her two or three years afterwards, and there was then no recurrence of the disease.

CASE CCCXV.—*Tumor of Thigh, over Great Trochanter.*
A soldier, 45 years of age, at the battle of Fredericksburg, Dec. 13, 1862, was wounded by the fuse of a shell which burst over him, producing a compound comminuted fracture of the left parietal bone, followed by paralysis of the right leg. In four months, he recovered from the wound and its effects, so as to be at work.

Four weeks after receiving the above wound, he noticed a small, hard, painless tumor on the right hip, on which side he had lain during his convalescence. This continued to grow rapidly, but did not interfere with the movements of the leg.

March 19, 1866, he entered the Hospital. A hard tumor was found, about six inches in circumference, situated just

behind the great trochanter of the right femur, with three distinct nodules on its surface, attached to the skin. It was slightly movable, and not attached to the bone. The integument in the neighborhood was not affected.

On March 21st, the tumor was removed, after careful dissection, involving the fascia of the deep-seated muscles. On making a section of it, its walls were found to consist of dense fibrous tissue, which enclosed a firm, dirty, yellowish substance. There was no line of demarcation between the two. A microscopic examination proved it to be a simple, fibrous tumor, the greater portion of which had undergone fatty degeneration. This tumor was probably caused by long-continued pressure on the hip on tissues in a low state of innervation.

The patient had a slow recovery, owing to the wound having been attacked by hospital gangrene, which was prevalent at the time. The wound not healing after some weeks, he was sent out of town; and I met him afterwards in the street quite well, and found that the large cavity left by the operation had at once commenced to heal rapidly on his removal from the air of the Hospital.

CASE CCCXVI.—*Formidable Fibrous Tumor, situated deeply in the Thigh. Operation. Recovery.*—A gentleman from New Brunswick, 32 years of age, consulted me on account of tumor of the thigh, in September, 1862. He had seen many surgeons, both at home and in Europe, about the tumor, and had been counselled by some not to have it interfered with. It was of eight years' standing, and had occurred in the following way: In the winter of 1859, while skating rapidly, his skate became caught in a crack in the ice, producing a violent wrench of the limb. The next day, the thigh became greatly swollen, and very painful. Four or five days afterwards, the swelling subsided, leaving, on the upper and inner side of the thigh, a lump the size of a small egg. This remained fixed; and the pain, in a great measure, disappeared. He went on with his usual avocations until the spring of 1860, when the tumor began to enlarge, and since that time had slowly increased. Three months before I saw him, the tumor began to grow very

rapidly; doubling in size, causing great pain, and preventing motion of the limb.

On the upper and inner side of the thigh was a large, circumscribed, movable tumor, situated deeply in the limb, under the extensor and adductor muscles, and great vessels. It had an apparent pulsation in it; but its diagnosis was obscured by its deep situation.

The patient being etherized, the thigh was rotated outwards, and partly flexed on the abdomen. An incision, eight inches in length, was now made, over the middle of the tumor, through the skin. The fascia was then divided, which exposed the adductor longus and gracilis muscles, spread over the tumor like a fan. The adductor longus being cut through, the adductor magnus was exposed, which, being divided, brought the tumor into view, with its layers of cellular membrane. It was now laid bare, and gradually dissected or separated, with the knife and fingers, from its investments; the hemorrhage being profuse, mainly from large venous trunks, some of which had to be tied. An oozing of blood continuing, the interior of the wound was lightly touched with a solution of the perchloride of iron, and a sponge, enveloped in a linen cloth, temporarily introduced to fill up the large cavity and produce compression.

The tumor was found to be fibrous. It was spherical in shape, about the size of a large cocoa-nut. It lay against the bone on its inner side, pressing the vessels outwards. Towards the latter part of the operation, the circulation became much depressed, and the face very sallow. Under the use of stimulants, in the course of a few hours the circulation was fully restored. In three or four days, there was considerable swelling in the thigh, which was relieved by a free suppuration. The wound, after this, healed well; and, at the end of six weeks from the time of the operation, he returned home perfectly restored, in high spirits, taking his tumor with him.

CASE CCCXVII. — *Uncommon Tumor of Thigh. Recovery.* — A gentleman applied to me in January, 1866, for a tumor of the leg, which had appeared under the following circumstances: About three months before, he was taken with a

pain in his left knee; the sensation being as if pebbles were in the joint. This was followed by an abscess under the skin over the joint. As he recovered from this, pain and swelling commenced about the middle of the thigh; the pain being so severe as to require the daily use of morphine injections under the skin. It was supposed to be connected with the sciatic nerve.

When he applied to me, he was pale and emaciated, and had lost about twenty pounds in weight. The knee was stiff, and he could limp only with difficulty. A hard swelling, as if on the bone, occupied nearly the entire thigh, and felt like ensheathing callus, such as is often felt, at the end of three or four weeks, around a broken femur. The whole swelling was very sensitive to the touch; but there was no redness nor appearance of a tendency to suppuration. It was difficult to say whether it was a tumor of the bone, the periosteum, or an inflammatory exudation among the muscles. The only case I had ever seen like it was a woman in the Hospital, March, 1862, whose case is given below.

I advised rest, laudanum fomentations on spongio-piline at night, and a general tonic treatment. This plan was pursued for a week, and the superficial swelling subsided, leaving only the apparent hard tumor of the bone; the pain being sufficiently alleviated to allow him to give up the opiate injections. On Jan. 28th, the rectus muscle suddenly disengaged itself from the swelling below, carrying with it a large, hard mass of lymph. Dr. S. Cabot, at this time, saw the patient with me, and agreed as to the treatment, but, with myself, was entirely doubtful as to the diagnosis.

The patient persevered in the treatment, and consulted me once or twice afterwards, at the interval of a month or more; and, when I last saw him, the tumor had almost entirely disappeared.

CASE CCCXVIII. — *Large Solid Swelling of the Thigh, lasting about two months, and then disappearing.* — In March, 1862, I was called to see an unmarried woman, 26 years of age, who, having about a week before received some

check from exposure to cold, was taken with a pain in the upper part of the left thigh, followed by a deep-seated swelling, principally on the front and outer part, which ultimately became quite hard, involving about half the limb. I had her removed to the Hospital, and put under treatment.

The tumor became more and more solid, the integument over it remaining natural. There was slight fever, and the swelling was moderately painful; but no tenderness or swelling in the course of the great vessels of the limb.

Several gentlemen who examined the tumor, at the end of three or four weeks, could make nothing of it, unless it was a rapid development of malignant disease. Under applications, principally of a warm and moist character, at the end of two months from the commencement of the disease the swelling entirely disappeared.

CASE CCCXIX. — *Erectile Tumor of Cheek.* — On Jan. 28, 1847, a man consulted me for a tumor, of ten years' standing, in the substance of the right cheek, bearing a striking resemblance to a case already related. The right cheek was forced outward, and at times had been one-third larger than the left. With one finger applied to the inside of the cheek and the thumb to the outside, so as to embrace the whole substance placed between them, I distinguished a hard lobulated tumor, quite movable, situated below the zygomatic arch, and partially extending up under it. With a little force, it could be carried outward, so as to make a projection over the ramus of the lower jaw. During the examination, I felt something of a less resisting nature slip from under my fingers. After one or two trials, taking into consideration the history of the case, I came to the conclusion that I had to deal with a tumor pervaded by erectile tissue. The patient entered the Hospital, and I operated on him in February. Before the operation, a number of gentlemen, who examined the tumor, could not be convinced that it was other than an ordinary steatoma. The patient was fully etherized. The tumor was then made to project over the lower jaw, by forcing it from the inside of the cheek. The first incision laid bare the muscle. This being divided, a

mass of vessels, principally venous, projected through the wound. These, together with the body of the tumor, were dissected out, with some hemorrhage. The operation was terminated by embracing with a ligature the base of this congeries of vessels. A severe attack of inflammation followed, which terminated in an abscess in the cheek. He left the Hospital well, in a fortnight. The nucleus of the tumor was composed of a fatty substance, quite firm before removal, but easily broken up by the fingers after it was dissected out. The greater portion of it was made up of erectile tissue.

CASE CCCXX. — *Painful Cutaneous Tubercle*. — A woman, 30 years of age, had a small, projecting, nipple-shaped tumor on the skin of the right nates. It was of five years' standing; and she complained greatly of the suffering occasioned by it, which was of the most insupportable kind, and occurred in paroxysms. At these periods, she would not allow any person to come near her.

The wound was examined, after the excision of the tubercle, for the purpose of discovering if any nervous filament had been pressed upon by it; but none could be detected. Its texture was fibrous; and no cancer-cells could be found in it, under the microscope. The character of the pain was the same as that observed in the subcutaneous painful tubercle. Entire relief followed its removal.

The subjoined tables give the immediate result in one hundred and fifty-five cases of malignant disease, operated on by myself during a period of twenty-six years. The table, for the last thirteen years, consists only of Hospital cases: and the whole table comprises only those patients who remained for a time under treatment; many who submitted to minor operations, such as cancer of the lip and of the integuments, leaving immediately after the operation, and no record of them being preserved.

The cases up to 1852 were collected from the Hospital records, by Dr. Albert A. Sawyer, and the remainder, by my son, Dr. J. C. Warren, formerly house-surgeons at the Hospital.

OPERATIONS FOR CANCER.

	No.	Sex.	Age.	Date.	Situation.	Variety.	Duration.	Operation.	Immediate Result.	Remarks.
Private.	1	F.	50	1840	Breast.	Scirrhus.	2 years.	Excision.	Well.	Well, 1852.
"	2	M.	41	1844	Right nipple.	"	10 years.	"	"	Partially removed by a cancer doctress, with caustic, six years previously.
"	3	F.	68	1846	Right breast.	Encephaloid.	18 months.	"	"	Living, March, 1852.
"	4	F.	42	1846	Jaw.	"	2 years.	"	"	Seen March 10, 1852.
"	5	F.	28	1846	Right breast.	Scirrhus.	5 months.	"	"	Breast had always been sore after nursing.
Hospital.	6	F.	76	1846	"	"	20 years.	"	"	Seen December, 1851, well. Since had small lump in cicatrix.
"	7	F.	45	1846	"	"	2½ years.	"	"	Returned in groin. Died in the course of a [year.
Private.	8	F.	50	1846	Testicle.	Encephaloid.	2½ years.	"	"	Ala had been destroyed; was restored from check by autoplasty.
"	9	M.	52	1846	Right breast.	Scirrhus.	2½ years.	"	"	Hereditary malignant tendency. One removal of tumor four years before; another, two years before.
"	10	F.	64	1846	Ala nasi.	"	8 years.	Removal.	"	
Hospital.	11	M.	23	1846	Parotid.	"	9 months.	"	"	
"	12	F.	39	1846	Breast.	"	4 months.	Amputation.	"	
"	13	F.	67	1846	Penis.	"	5 months.	Removal.	"	
"	14	M.	33	1846	Submaxillary gland.	"	3 months.	Extirpation.	Relieved.	
"	15	F.	48	1846	Upper jaw.	Encephaloid.	2½ years.	Excision.	Well.	Re-appeared in a month, with wound unhealed, and large, hard glands under the angle of jaw.
"	16	F.	48	1846	Breast.	Scirrhus.	2 years.	"	"	Seen six months after; return of disease in cicatrix, ulceration, scirrhous glands in axilla; cough.
"	17	F.	38	1846	Lip.	"	5 months.	"	"	Excision six months before; returned two months before; applied too late for a second operation.
"	18	M.	41	1848	Breast.	"	11 months.	Caustic applied.	Not relieved.	Nipple retracted, and bloody discharge previous to operation.
"	19	F.	46	1848	"	Encephaloid.	1 year.	Excision.	Well.	Died six months or a year after, of cancer of rectum.
"	20	F.	48	1848	Left breast.	Scirrhus.	1 year.	"	"	
Private.	21	F.	40	1848	Navel.	"	15 years.	"	"	Well, March, 1852.
"	22	F.	60	1848	Integuments of chest.	"	9 years.	"	"	Returned three weeks after. Died.
"	23	F.	50	1848	Mouth.	"	1 year.	"	"	
"	24	M.	42	1848	Left breast.	"	10 years.	"	"	
Hospital.	25	F.	40	1848	Right breast.	"	6 months.	"	"	
Private.	26	F.	35	1848	Left breast.	"		"	"	
"	27	F.		1848		"		"	"	

OPERATIONS FOR CANCER. — *Continued.*

	No.	Sex.	Age.	Date.	Situation.	Variety.	Duration.	Operation.	Immediate Result.	Remarks.
Hospital.	28	M.	54	1848	Parotid.	Scirrhus.	9 months.	Excision.	Well.	Had cancer of face removed by me six years before. Since died.
Private.	29	F.	33	1849	Right breast.	"	2 years.	"	"	Well, March, 1852.
"	30	M.	40	1849	Palm of hand.	Fungoid.	1 year.	"	"	Returned. Died.
"	31	M.	7	1849	Ear.	"	4 months.	"	"	
Hospital	32	F.	52	1849	Breast.	Scirrhus.	2 years.	"	Much relieved.	
"	33	M.	27	1849	Femur.	Encephaloid	9 months.	Amputation.	Relieved.	Died some months after, with pulmonary symptoms.
"	34	M.	54	1849	Face.	"	10 months.	Excision.	Well.	
"	35	M.	71	1849	Eye lid.	Scirrhus.	4 years.	"	"	
"	36	F.	37	1849	Breast.	"	2 years.	"	"	
"	37	F.	52	1849	"	"	2 years.	"	"	
"	38	F.	32	1849	"	"	6 months.	"	"	
"	39	M.	15	1849	Lower jaw.	Encephaloid	2½ years.	"	"	
"	40	M.	52	1849	Tibia.	Scirrhus.	23 years.	Amputation.	Well.	
"	41	F.	24	1849	Cicatrix on thigh.	Fungoid.	22 years.	"	Died.	From accidental erysipelas and peritonitis.
Private	42	F.	50	1850	Right breast.	Scirrhus.	2 years.	Excision.	Well.	Very weak before operation; sank rapidly; no trace of malignant deposit on autopsy.
"	43	M.	64	1850	Integuments of chest.	"	Many yrs.	"	"	Returned in axilla. Died one year after.
"	44	F.	60	1850	Border axilla.	"	4 months.	"	"	Encephaloid in both axillae one year after. Died.
"	45	F.	56	1850	Right breast.	"	4 years.	"	"	Died one year after with typhoid symptoms.
"	46	F.	60	1850	Upper jaw.	Encephaloid.	6 months.	"	"	Remained well two years. Died of internal disease.
"	47	M.	24	1850	Lip.	Scirrhus	"	"	"	Well, 1852.
Hospital.	48	F.	24	1850	Side.	Melanosis.	3 months.	"	"	
Private.	49	F.	45	1850	Right breast.	Scirrhus.	2 years.	"	"	Well until 1852; then return in axilla.
"	50	M.	30	1850	Thigh.	Encephaloid.	2½ years.	"	Recovered	Returned; reported amputation of thigh by quack; death on spot.
"	51	M.	68	1850	Lip.	Scirrhus.	1 year.	"	Well.	Well, 1852.
"	52	F.	68	1850	Right breast.	Scirrhus and encephaloid.	1 year.	"	Recovered.	Operation by request of friends. Disease returned, and she died.
"	53	F.	60	1850	Ala nasi.	Scirrhus.	"	"	"	I removed cancer from her nose five years before. Returned, 1851.
"	54	F.	38	1850	Right breast	"	1 year.	"	"	Erysipelas.
"	55	M.	30	1851	Arm.	Encephaloid.	6 months.	Amputation.	Died	Amputation at shoulder-joint.
"	56	F.	54	1851	Left breast.	Scirrhus.	14 months.	Excision.	Recovered.	
"	57	M.	54	1851	Ala nasi.	"	14 months.	"	Well.	
"	58	F.	64	1st, 1841 21, 1851	Right breast.	"	1 year.	"	"	First excision, 1841; return, 1850; second excision, 1851.

OPERATIONS FOR CANCER. — *Continued.*

No.	Sex.	Age.	Date.	Situation.	Variety.	Duration.	Operation.	Immediate Result.	Remarks.
59	Private.	M.	35	Testicle.	Encephaloid.	2 years.	Excision.	Recovered.	Died the year after, with anacaulous symptoms.
60	"	F.	49	Left breast.	Scirrhus.	3 years.	"	Died.	From erysipelas.
61	"	M.	35	Ankle.	Encephaloid.		Amputation of thigh.	Recovered.	Died with pulmonary symptoms some months after.
62	"	F.	60	Left breast.	Scirrhus.	6 months.	Excision.	Well.	Milk abscess thirty years before; well, 1852.
63	"	F.	60	Right breast.	"	6 months.	"	Recovered.	Died of internal disease soon after.
64	Hospital.	F.	62	Neck.	Encephaloid.	20 years.	"	Well.	Well, 1852.
65	Private.	M.	84	Parotid.	Fungoid.	6 months.	"	"	Returned; bled freely from tumor before operation; much relieved by operation.
66	"	F.	60	Right breast.	Scirrhus.	2 years.	"	"	Well, 1852.
67	"	F.	52	Left breast.	"	6 months.	"	"	Believed to be well, 1852.
68	"	F.	50	"	Encephaloid.	6 months.	"	"	Well, 1852.
69	"	F.	35	Right breast.	Scirrhus.	9 years.	"	"	Well, 1852.
70	"	F.	50	"	"	3 years.	"	"	Had a cancer removed from left breast twenty-five years ago.
71	"	M.	48	Lower lip.	"		"	Recovered.	Had been three or four times operated on. Returned, 1852.
72	"	M.	39	Back.	"	3 months.	"	Well.	Well, 1852.
73	"	M.	70	Face.	"	1 year.	"	"	
74	"	F.	44	Right breast.	"	4 years.	"	"	
75	Hospital.	F.	50	"	"	1 year.	"	"	
76	"	M.	55	Parotid.	"	25 years.	Removal.	Well.	Had been operated on by cancer doctor during seven or eight months.
77	"	F.	50	Right breast.	"	1 year.	"	"	Application of caustic previously.
78	"	M.	68	Lip.	Epithelial.	2 years.	"	"	Does not use tobacco.
79	"	M.	48	"	"	2 years.	"	"	Applications of caustic previously. Smokes a pipe. Caused by a blow.
80	"	F.	62	"	"	2 years.	"	"	Has used a pipe.
81	"	M.	52	"	"	4½ years.	"	"	Smokes. Hereditary tendency. Treated by quacks. Re-appeared July 3d.
82	"	M.	29	Skin.	"	4½ years.	"	"	Removed, 7 months before.
83	"	M.	25	Neck.	Melanosis.	3 years.	"	Not relieved.	Smokes.
84	"	M.	43	Lip.	Epithelial.	5 years.	"	Well.	Abscess in breast when young.
85	"	F.	34	Right breast.	Scirrhus.	4 months.	"	"	Scirrhus removed from parotid, 20 years before.
86	"	M.	45	Left cheek.	Epithelial.	8 months.	"	"	Again operated on Nov. 19th. Return of disease in 3 months.
87	"	M.	61	Tongue.	Scirrhus.	6 years.	"	"	Operated on before, May, 1853.
88	"	F.	38	Breast.	"	18 years.	"	"	Operated on before Nov. 15, 1849, and June 4, 1853. Return in July.
89	"	F.	47	"	Encephaloid.		"	"	

OPERATIONS FOR CANCER. — *Continued.*

No.	Sex.	Age.	Date.	Situation.	Variety.	Duration.	Operation.	Immediate Result.	Remarks.
Hospital.									
90	M.	75	'55, June 28	Lip.	Epithelial.	14 years.	Removal.	Well	Chews and smokes.
91	M.	75	'55, Aug. 2	Face.	"	10 months.	"	Much relieved.	Operated on previously by ligature.
92	M.	70	'57, May 4	Forehead.	"	3 years.	"	Well.	Commenced with black scab.
93	F.	53	'57, June 17	Face.	"	11 years.	"	"	Large rusty-looking tumor size of half a dollar.
94	F.	35	'57, June 25	Breast.	Scirrhus.	3 months.	"	"	Skin dissected up, and wound covered.
									Small tumor in breast since childhood. Pre-sent tumor developed in it while nursing first child, now a year old.
95	F.	42	'58, Jan. 5	"	"	1 year.	"	"	Had been nursing child, which she weaned; and was again six months pregnant.
96	M.	75	'58, Mar. 25	Lip.	Epithelial.	3 months.	"	"	Inveterate smoker.
97	M.	17	'59, Mar. 23	Thigh.	Osteosarcoma	7 months.	"	"	Amputation at the hip-joint.
98	M.	54	'59, Apr. 2	Lip.	Epithelial.	2½ years.	"	"	
99	F.	60	'59, May 6	Nose.	"	7 years.	"	"	
100	M.	43	'59, Aug. 18	Eye.	"	18 years.	"	"	Tumor size of apple covering part of face. Former operation by excision and ligature.
101	F.	54	'60, Mar. 30	Right breast.	Scirrhus.	8 months.	"	"	Commenced in eyelid, involved eye. Patient seen well some years after.
102	M.	75	'60, Apr. 11	Lower jaw.	Epithelial.	3 months.	"	Died.	Patient well in 1866.
103	M.	64	'60, May 9	Lip.	"	2 years.	"	Well.	Disease removed from lip 3 years before.
104	M.	2	'60, May 24	Eye.	Encephaloid.	3 months.	Extirpation.	"	Smokes with other side of mouth; commenced with wart.
105	F.	50	'60, June 6	Lip.	Epithelial.	9 years.	Removal.	"	Disease attributed by mother to her seeing a man blowing bubbles of glass.
106	M.	54	'60, June 20	Face.	"	6 months.	"	Relieved.	Smokes pipe.
107	F.	25	'60, June 20	Lower jaw.	"	2 years.	"	Well.	Now well, 1866. Disease a recurrent one; extended to cheek.
108	M.	50	'60, Oct. 8	Face.	"	15 years.	"	"	Case of rodent ulcer, and not cancer; after the third operation, patient died.
109	F.	23	'61, Jan. 25	Breast.	Scirrhus.	8 months.	"	"	
110	F.	53	'61, Apr. 17	Left breast.	"	6 months.	"	"	Operated on again Sept. 14th; resembled chronic mammary tumor before operation.
111	F.	30	'61, Apr. 30	Right breast.	"	10 months.	"	"	Tumor appeared while nursing; whole breast infiltrated with cancer; operation to relieve excessive pain.
112	M.	37	'61, May 16	Left side of neck.	"		"	"	Recurrent tumor involved whole of neck; projected into throat; internal jugular cut and tied.

OPERATIONS FOR CANCER. — Continued.

	No.	Sex.	Age.	Date.	Situation.	Variety.	Duration.	Operation.	Immediate Result.	Remarks.
Hospital.	113	M.	44	'61, May 16	Face.	Epithelial.	6 years.	Removal.	Well.	Secondary cancer involving lip and chin; had been tampered with by a quack. Disease removed December previously. Disease returned by Nov. 27th. Melanosis.
"	114	M.	23	'61, May 18	Groin.	Melanosis.	5 months.	"	"	Operated on again March 10, 1862, — again March, 1862, and October 23, 1863.
"	115	F.	35	'61, May 29	Left breast.	Scirrhus.	3 months.	"	"	Disease afterwards returned.
"	116	F.	50	'61, June 22	"	"	4 years.	"	"	
"	117	F.	55	'61, Oct. 18	"	Encephaloid.	4 months.	"	"	
"	118	M.	45	'61, Nov. 6	Left lower jaw.	"	6 years.	"	Not relieved.	
"	119	F.	46	'61, Dec. 3	Left breast.	Scirrhus.	6 months.	"	Well.	
"	120	F.	47	'61, Dec. 26	"	"	10 years.	"	"	
"	121	F.	76	'62, Feb. 20	Right eye.	Melanosis.	3 years.	"	"	Well in 1866.
"	122	F.	61	'61, Mar. 20	Left breast.	Scirrhus.	14 years.	"	"	Disease commenced on the face; caustic was applied by a "girl" a year since, causing it to spread.
"	123	M.	45	'62, May 21	Tongue.	Melanosis.	4 months.	Ligature.	Not relieved.	Cancer in an ulcerated state.
"	124	M.	46	'62, May 24	Parotid	"	22 months.	Removal.	Relieved.	Had been cut into and bled freely; now ulcerated with bleeding fungus, skin cut around base and removed with écarateur.
"	125	M.	52	'62, June 19	Right eye.	Scirrhus.	1 year.	"	Well.	Died some years after of another disease.
"	126	F.	31	'62, Aug. 12.	Right breast.	Encephaloid.	1½ years.	"	"	
"	127	M.	25	'63, May 18	Right testis.	Epithelial.	1 year.	"	"	
"	128	F.	58	'63, Sept. 28	Nose.	"	1 year.	"	Relieved.	Commenced like a horn; occupied the whole side of nose.
"	129	M.	58	'64, April 20	"	Colloid.	12 years.	"	Well.	After second operation, on June 1st.
"	130	M.	40	'64, April 23	Nates and coccyx.	"	"	"	Recovery.	Required dissection into pelvis between rectum and sacrum; healed, but afterwards recurred.
"	131	M.	61	'64, Sept. 13	Tongue.	Scirrhus.	6 months.	Ligature.	Well.	Recurred; ultimately died.
"	132	M.	33	'65, Jan. 23	Neck.	Colloid.	2 months.	Removal.	"	Removed August, 1861; recurrence; arm partially paralyzed and painful; operation, at urgent request, was repeated again about a year subsequently.
"	133	M.	25	'65, Mar. 25	Lip.	Epithelial.	3 months.	"	"	Chewed tobacco.
"	134	M.	47	'65, Mar. 25	"	"	5 years.	"	"	No tobacco.
"	135	M.	40	'65, Mar. 25	Right testis.	Encephaloid.	2½ years.	"	"	Very elastic; was supposed to have been a hydrocele.
"	136	F.	36	'65, Mar. 28	Left labium.	Scirrhus.	1 year.	Amputation.	"	
"	137	M.	64	'65, April 26	Scrotum.	Melanosis.	4 years.	Removal.	"	
"	138	M.	86	'65, May 15	"	Epithelial.	3 years.	Ligature.	Relieved.	

OPERATIONS FOR CANCER. — *Concluded.*

	No.	Sex.	Age.	Date.	Situation.	Variety.	Duration.	Operation.	Immediate Result.	Remarks.
Hospital.	139	M.	81	'65, May 10	Lip.	Epithelial.	10 years.	Removal.	Well.	No tobacco; third operation; was in the habit of carrying nails in mouth. No tobacco.
"	140	M.	20	'65, May 13	"	"	1 year.	"	"	"
"	141	F.	35	'65, June 6	Left breast.	Scirrhus.	18 months.	"	"	"
"	142	F.	57	'65, June 24	"	"	1½ years.	"	Died.	"
"	143	F.	65	'65, Nov. 14	Right breast.	"	9 months.	"	Well.	Came at seat of broken breast. Commenced with scales; followed by crack in the lip.
"	144	F.	70	'66, Mar. 10	Lip.	Epithelial.	"	"	"	Smoked a pipe.
"	145	M.	47	'66, Mar. 17	"	"	10 months.	"	"	"
"	146	M.	25	'66, Mar. 31	Testis.	Encephaloid.	8 years.	Excision.	"	"
"	147	M.	64	'66, May 9	Breast.	Scirrhus.	4½ years.	"	"	Father died of tumor of abdomen.
"	148	M.	70	'66, May 12	Lip.	Epithelial.	20 years.	Removal.	"	No tobacco.
"	149	F.	70	'66, May 14	Vulva.	"	2 years.	Excision.	"	Great relief, with complete and rapid cicatrization.
"	150	M.	47	'66, May 23	Cheek.	"	3 years.	"	"	Smoked a pipe.
"	151	M.	45	'66, June 6	Lip.	"	1 year.	Removal.	"	"
"	152	M.	63	'66, June 16	"	"	6 years.	Excision.	"	Had been under care of cancer doctor; glands in groin enlarged.
"	153	F.	68	'66, June 15	Vulva.	"	6 months.	Removal.	"	Instead of ether, lip was frozen with new atomizing apparatus. Had bad teeth.
"	154	M.	45	'66, June 23	Lip.	"	6 months.	"	"	"

CHAPTER XII.

GUNSHOT WOUNDS.

SINCE the late war, gunshot wounds, and other wounds produced by warlike weapons, have received an increased interest, and are now being extensively illustrated by the elaborate works published by Surgeon-General Barnes, under the direction of the American Government. Some of the beautiful photographic illustrations of important surgical cases and operations, by Dr. George A. Otis, Surgeon U.S. Volunteers, and Curator of the Army Medical Museum, which surpass in the art any thing of the kind which has thus far been accomplished, have already appeared. Circular No. 6 — being the preliminary surgical report of Dr. Otis to the Surgeon-General — is of especial value. The same may be said of the medical report by Dr. J. J. Woodward. "The battle-field lists of wounded, for the years 1864-5, include over 114,000 names."

To give an idea of the amount of material which presents itself for observation, I make the following quotation from Dr. Otis's valuable report: —

"In comparing the numbers of cases of some important injury, as, for example, gunshot fractures of the femur, it is found, that, in the French Crimean army, there were 459 such injuries, and, in the English army, 194; while over 5,000 such cases have been reported to this office. Or, if one of the major operations is selected for comparison, as excision of the head of the humerus, the Crimean returns give 16 of these excisions in the British, and 38 in the French army; but the registers of this office contain the detailed histories of 575 such operations."

The Crimean war gave rise to one or two valuable works, bringing the subject more particularly before the public than it

had been since the splendid work of Larrey, and those of Guthrie, Hennen, and others during the wars of Napoleon.

In regard to the destruction of life, caused by the passage of projectiles from fire-arms near the body without touching it, there has long existed a popular delusion. In many cases, it has been proved by dissection, that the body has been struck by the ball, which left no external marks of its passage. Large effusions of blood have been found in the thoracic and abdominal cavities, organs ruptured, and bones and muscles disorganized, without any abrasion of the integument outside, to indicate the point where the missile struck. This is the result of the elasticity of the skin, which in itself offers but little resistance, yielding to a great degree, while the firmer texture of the bones, muscles, and organs, does not permit of so much relaxation. It may fairly be said that no one was ever killed by the wind of a cannon-ball.

These remarks are confirmed by conversations with military and naval surgeons who have had the experience of the whole war, and who have had an opportunity of witnessing and learning, by personal experience, the effect of the passage, near the body, of projectiles of a larger size than any ever used in warfare before. The testimony of officers and soldiers is to the same effect.

In the early part of the war, before the subject had received much attention in this country, I published some cases of gunshot wounds, also of injuries of the nerves from weapons; the results of treatment of the latter, at that time, being very meagre. A few of the former cases, with additional ones, are here presented. The latter have already been given.

CASE CCCXXI. — *Bullet split by coming in Contact with Bone.* — An occurrence very common with the ordinary spherical bullet is to split on coming in contact with bone. The following case occurred at the battle of Bull Run: Lieutenant B. was struck on the left side of the os frontis with a round ball, and was supposed by his comrades to be mortally wounded. He was made prisoner, and taken to Richmond. A projection was felt under the scalp, about four inches from the

wound in the integuments, and an incision made over it, from which half of the bullet, with a highly polished cut surface, was removed. He remained seven months a prisoner at Richmond, during which time the wound in his forehead continued open, and suppurated freely. He was troubled with some uneasiness in the head, and occasional headache. On his arrival at Fortress Monroe, after his release, this discharge still continuing, he was examined by Dr. Cuyler, United-States Army, who discovered a metallic substance deep in the wound. This was skilfully extracted. The patient states a small portion of brain escaped at the time. On examination, the extracted body proved to be the other half of the ball, flattened on both sides, and having embedded in it a portion of the skull. On the next day, a piece of the inner table of the skull, which had been driven before the ball into the brain, was also extracted. After the removal of these substances, the wound healed.

The patient afterwards came under my care, and remained for some time in delicate health.

Dr. Fox, of the Naval Hospital at Chelsea, showed me a case in which a ball penetrated in the middle of the arm, and was cut out over the scapula. In its passage, it struck the edge of the scapula; the ball being cut nearly in halves, and flattened out in this position.

In almost every instance I have met with, when the round ball encountered bone, it was either flattened, or, if it met the edge of a bone, as of the jaw or rib, it was split.

CASE CCCXXII. — *Gunshot Wound in the Neck.* — At the battle of Bull Run, a man was struck in the neck, just behind the angle of the jaw, over the point of bifurcation of the carotid artery. The shot being fired from below, the ball penetrated in an upward direction, and struck the edge of the jaw, which cut it in two, one portion remaining in the neck. The other, and larger part, passed through the base of the tongue, carried away a portion of the alveolar process of the upper jaw, and escaped through the cheek. The hemorrhage from the wound was at first rather profuse, but was checked by pressure with a handkerchief, and did not recur. The wounds healed kindly;

but an abscess formed in the neck, which was opened, and portions of lead and spicula of bone were removed from it. After one or two abscesses of this kind had formed, he recovered.

CASE CCCXXIII. — *Gunshot Wound in the Leg.* — A man, 27 years of age, was hit by a bullet on the inside of the left leg, about its middle. The ball passed through the tibia, producing a compound fracture of the bone. The fracture united after a very long time, as also the wound of entrance. The wound of exit, however, remained open, and when I saw him, eight months after the receipt of the injury, was of the size of a half-dollar, and had an unhealthy look, resembling epithelial cancer. The edges of the wound had already been dissected up, in the hope of relieving tension, and producing a healthy state of the wound. I determined to dissect out the entire ulcer, which was done. In the centre of the wound, and between the bones, a black substance was discovered in an encysted state. This was at first thought to be powder, but was afterwards explained by the patient stating, that when in Richmond, on account of a sloughy condition of the wound, he had been in the habit of sprinkling it with charcoal, some of the granules of which had been covered up, and retained there. The wound, after the operation, took on a healthy action, and soon closed.

CASE CCCXXIV. — *Gunshot Wound through the Os Calcis.* — The following case exemplifies the very slow way in which wounds of a spongy bone take on the healing process: Richard Roe, a private in the First Regiment Massachusetts Volunteers, was struck by a ball in the left heel; the ball passing round the os calcis, and coming out on the other side. The enemy were firing up from a hill, a little below. Shortly afterwards, he exposed the other foot, when another ball struck him in exactly the same spot on that foot, passing through the os calcis. He was carried a prisoner to Richmond, where he was under the care of Dr. Charles Bell Gibson, of the Confederate Army. Inflammation was so extensive, and the pain so severe, that he at one time requested Dr. Gibson to amputate the foot, which he very properly declined to do. The patient came under my care

about six months afterwards, having regained his liberty. On probing the wound, I discovered a large piece of detached bone. The wound was enlarged, and a portion of bone, the size of a chestnut, removed; and the bone, which was rough in one place, made smooth. After this, the wound gradually healed, so that, at one time, he could use his foot in walking. It then became inflamed again, and began to discharge. I advised him to enter the Hospital, two months after the first operation. The bone was then exposed by a large incision, and the whole interior of the cavity excavated with a chisel and drill. The mouth of the aperture in the bone was made much wider than the interior. In April, 1862, nearly nine months after the accident, the wound was nearly healed, but still painful if he attempted to walk; and it was difficult to say whether he would recover without the removal of the whole bone. The rest of the foot was in a perfectly healthy state. In June, 1862, the wound had contracted to a small point, there was a serous exudation from it, and he was able to walk about. Now, 1867, it is perfectly well. In most cases where I have had to operate for caries of the os calcis, repeated operations have been required.

CASE CCCXXV. — *Gunshot Wound in the Thigh. No Trace of the Ball at first to be discovered.* — Major S., while at the head of his regiment at the battle of Newbern, received a ball in the upper and front part of the thigh, about two inches below Poupart's ligament. The whole regiment, at the time, were in the advance, and were exposed in an open field, in a reclining position, firing on the enemy, who, in return, were firing down upon them from breastworks. He felt a blow on the leg as if from a stone, and was not aware that he was wounded, until, on removing his coat, he saw the blood flowing freely. He went on giving his orders until he became faint, and was taken to the rear. The wound, being probed by the surgeon, was found to extend in a direction downward and inward for three or four inches. The ball could not be found in the wound, nor could any trace of it be detected elsewhere. The only sensation he felt, in addition to a general want of power in the limb, was that of slight numbness in the calf of the leg, and

a soreness in the foot. Perfect rest of the limb was enjoined upon him; and, shortly afterward, he was brought home in a transport vessel, with other wounded soldiers. I saw him, in company with his physician, Dr. Charles Gordon, about three weeks after the date of the injury. An excavated ulcer, of the size of a quarter of a dollar, marked the situation of the entrance of the ball. Underneath it, in the cellular membrane, was a deposit of lymph, which, on being moved to and fro over the muscles, gave at first the sensation of the presence of a ball at that spot. A small pinhole in the centre, from which issued a serous fluid, at first seemed to confirm this view: the history of the wound, however, was opposed to it. A probe, being gently pressed into the opening, encountered no foreign substance. The patient being of fine physical development, and quite free from fat, the contour of the various muscles was strongly marked. A careful examination was now made of the whole limb, commencing at the toes and going up to the groin, making such manipulations as to leave no one of the muscles or intermuscular spaces unexplored. Not the slightest pain could be produced, or induration felt, to mark the presence of the concealed bullet. Finding no trace of the ball, it was decided to allow the patient to use the limb. On first making an attempt to stand, he found much difficulty in doing so, both from the stiffness of the wound and from the disuse of the limb; but, being supported by two persons, and making an effort, he was gradually enabled to move around the room. I advised a continuance of this exercise, in order that he might regain, as soon as possible, the power of the muscles, and with the hope that the muscular action would bring the ball from its hiding-place. This proved to be the case; for, in about a couple of weeks, a hard, movable substance, which felt like half a sphere, was found travelling up the limb. The bullet, it was hoped, would follow up the track of the wound; but it was soon discovered that it was very movable, quite under the rectus muscle, and could not be distinguished at all when this muscle was contracted. After arriving under the old wound, it was thought possible that it might rest there; but it was found that its disposition was upwards, towards the groin. Major S., being very desirous to get rid of it, and rejoin his regiment, decided to have it removed.

The ether being given, the patient was placed on a table, with the light from above; and an incision was made through the skin, cellular membrane, and fascia, and the muscle uncovered. No cicatrix could be found further, as a guide. The ball was now fixed by an aid, and the muscle carefully cut through; a vessel that ran across it being tied, so as to prevent any deep-seated effusion of blood. The ball, from its constant disposition to change its position for an inch or more, caused some embarrassment. It was felt to be resting on the bone, and was then fixed by two fingers in the deep wound, and the muscular fibres over it cut, and its blue color was seen through the delicate investing sac. It was necessary to divide this in several directions, before it could be pushed out with a director. It was a round bullet, flattened on one side, as if it had struck the bone, and then glanced down the limb. The bone, not denuded, could be felt beneath. The wound was brought together by adhesive straps, and a cold water-dressing placed over it. The most rigid quiet was enjoined. The limb, on the following day, was sore and swollen; and, on the fourth day, an abscess formed in the situation of the sac which contained the bullet, and discharged itself through the wound. By continued rest of the limb, and absence of muscular motion, any effusion of pus under the muscle was prevented. The patient completely recovered.

In the present instance, and in one or two similar ones, no tenderness in the track of the ball pointed out the course which it had taken; and this fact is important, as the want of sensibility in the track taken by it is occasionally given as an argument that it has not entered at all. As before stated, a pain was felt in the calf of the leg, at the time the wound was received; also a numbness of the foot, and soreness about the ankle. The former disappeared after a time; but the soreness of the ankle continued until the extraction of the ball.

CASE CCCXXVI. — *Gunshot Wound from a Conical Bullet in the Calf of the Leg.* — Lieutenant C., of the Second Massachusetts, whose regiment had fought during the whole day, as rear-guard in retreat, the day before the battle at Winchester, and probably saved the army, arrived in camp at twelve o'clock

at night, having marched thirty-five miles without food and drink, except the muddy water of the roadside. Lieutenant C. had charge of the camp-guard for the night. At four o'clock in the morning, the battle began, and lasted four hours; and, when the regiment was in danger of being surrounded, the order for retreat was given. The regiment formed, and marched down the hill into Winchester, regardless of the enemy in full pursuit, who were firing into them. Lieutenant C. was in command of the rear company; in fact, the last person bringing up the rear. He received at this time a shot in the calf of the leg, the sensation being that of a violent blow with a club, which knocked him down. He attempted to rise, but, after stumbling a few steps, fell headlong. By this time, fortunately, the sergeant of his company perceived his situation, and, being a man of great size and strength, took him in his arms, carried him about two hundred yards into the streets of Winchester, and deposited him in the only ambulance-wagon that happened to be there. A number of other wounded men were put into the same wagon, some of them lying upon him. He contrived to put his head out of the front of the vehicle, so as to get air; and, in this position, with a man lying on his wounded leg, remained until they arrived in Williamsport, on the following morning, — some twenty hours. He was so completely pinned to the spot, that he was unable to sheathe his sword, which lay drawn by his side, just as he was placed with it in the ambulance.

On the passage through Winchester, a shell, apparently thrown at the ambulance, which, if it had penetrated, would have destroyed all the wounded within, killed a man lying within two feet of Lieutenant C. On the afternoon of the following day, Lieutenant C. had his wound examined. It was found that the ball had penetrated at the outer and upper part of the left leg, passing through the belly of the gastrocnemius muscle, in the vicinity of the great vessels, and had been stopped by the bone. It had carried in with it a patch of the trousers and the drawers, which were of thick knit woollen, without tearing them. From the swelling of the wound, the whole of this plug, nearly as large as the cork of a quart bottle, had been completely wedged into it, so as only to be withdrawn by

free incisions. The wound remained quite painful for a few days, until suppuration had commenced; and, after the lapse of a month, slowly healed, the patient getting about on crutches. The leg was somewhat bent, and could not easily be placed on the floor, on account of the contraction of the injured muscle.

The case is given somewhat in detail, to show to what extent the soldier is exposed, independently of the danger from his wounds. That a young man, scarcely eighteen, should be able to march thirty-five miles with his regiment, constantly fighting, and without food, keep guard all night, engage in a battle lasting four hours the next morning, be wounded, and, while suffering and bleeding, lie twenty hours with a man on his swollen limb, with nothing to sustain him, except on the second day a swallow of whiskey, — shows how much the human frame will bear when assisted by spirit and determination.

This patient was afterwards wounded in the arm, injuring the nerve; and the case is related in the chapter on injuries of the nerves. Subsequently, he was twice under my care with serious gunshot wounds. It is a curious fact, that, before the war, I had him in charge three times, with fracture of the leg or arm, being an uncommon instance of repeated injuries requiring surgical assistance. He finally fell a victim to the results of exposure, incurred during Sherman's campaign.

CASE CCCXXVII. — *Wound in Chest from Grape-shot.* — A soldier, 28 years of age, was brought into the Hospital on account of a wound in the thorax, received a week before at the battle of Newbern. The ball, which was an iron one, weighing six and a half ounces, struck him, as he was in a stooping position, in the left axilla, wounding the fleshy part of the arm, which was in contact with the side. It forced in the ribs, probably ran between the skin and the parietes of the thorax, and made its appearance under the skin of the sternum, where it was cut out. The ribs were broken at their junction with the sternum; the lungs wounded, and he expectorated blood. In what manner the wound in the lungs was produced, it was impossible to say, — whether by the ball or the fractured ribs. When he entered the Hospital, no tenderness or local appear-

ance indicated the track of the ball; so that it could not be said whether it had gone through the chest, or had run along on the outside of the ribs. The wound in the axilla healed rapidly, but on the sternum very slowly. There was no fistulous opening left, and no discharge of bone. The patient recovered slowly, his principal symptom being great debility.

CASE CCCXXVIII. — *Bullet in Pelvis. Excruciating Pain in Sciatic Nerve. Operation. Relief.* — J. Y., aged 18, received two balls at the battle of Williamsburg. One struck him on the upper and back part of the left arm, and went behind the bone, coming out in front of the chest. The other entered an inch above a line drawn midway between the trochanter major and middle of the sacrum, in the left hip, and disappeared there. He was disabled, though not in great pain at first. A week after, he was seized with the most excruciating pain in the course of the sciatic nerve of that side. He was taken to Baltimore, from which place he was brought on to Boston by steamboat and railroad, being carried always in his father's arms, to lessen the jar from the motion of travel. I saw him about ten days after the receipt of the wound. His left limb was drawn up, and he could not make the slightest movement without severe pain. A probe, passed into the wound, penetrated three inches, when a hard substance was encountered. Whether it was bone, or the bullet crushed against the bone, could not be determined.

The following day, I had him removed to the Hospital, and made an exploratory examination under ether. The external wound being enlarged, the finger passed through the gluteus maximus, under which was a cavity. Still farther on, through a narrow space, the pelvis was reached, and a smooth opening which appeared to be the sciatic notch. On the inner side of the notch was a hole, through which the ball had penetrated into the pelvis; the spicula of bone lying loose in the neighborhood of the sciatic nerve. These were removed. Another smooth cavity, which would hold an ounce of fluid, had been formed under the deep muscles. A probe passed easily two-thirds through the pelvic cavity, without encountering the ball. Water-

dressings, and a poultice afterwards, were put on the wound; and the patient was much relieved by the operation. The principal cause of irritation appeared to be the fragments of bone lying on the great nerve. The situation of the ball does not appear. The patient returned home greatly relieved; and, so far as I have learned, the ball never made its appearance, nor caused him farther trouble.

CASE CCCXXIX. — *Molar Tooth lodged in the Tongue.* — A soldier, about 20 years of age, entered the Hospital, about ten days after the battle of Williamsburg, having received a wound from a bullet, which struck the right side of the lower jaw, and passed out through the upper lip. The jaw was shattered; and, when he entered the Hospital, there were purulent deposits connecting with the neck externally, and the mouth internally. The patient was etherized; and, the wound being explored, pieces of bone were found everywhere buried in the substance of the cheek and the surrounding soft parts. These were extracted, and the wound healed rapidly. Some weeks afterward, he presented himself at the Hospital, with a swelling in the tongue, the edge of which had been wounded by the bullet, and which, until lately, he had been unable to protrude. On examination, a hard body was found embedded in the substance of the organ, which, on being cut upon, proved to be a molar tooth, which had been knocked out of the jaw, and buried in the tongue.

CASE CCCXXX. — *Bullet lodged in the Corpus Cavernosum.* — I was invited by the late Dr. Fox, Surgeon of the United-States Naval Hospital at Chelsea, to see the following interesting case and operation: On 30th May, 1862, a man about 30 years of age, while engaged in a boat attack in Florida, was fired upon by a party from shore. One bullet passed through the left leg near the calf, and was cut out on the opposite side. Another struck him at the outer and upper part of the same limb, passed through the thigh, emerging near the root of the scrotum in the fold of the thigh. It then entered again, near the same spot, and disappeared, and he had no farther trouble

from it for the time. He returned home, and came under the charge of Dr. Fox. Afterwards, the ball was discovered at the root of the penis, in the corpus cavernosum of the left side, from which place it gradually worked over to the right. The man had no difficulty in urinating, and no pain during erection. The point of the bullet, which was a Minié one, was towards the body. It was firmly held by the fingers, and then cut down upon. The skin was first divided, then the strong fibrous covering of the cavernous body: and, although the incision was quite free, the foreign substance resisted the use of ordinary forceps, the elastic force and suction of some of the tissues operating to prevent its extraction. The wound being held well open, a pair of bullet forceps was introduced, and the ball slowly extracted, as if from a bed of India-rubber. There was no violent rush of blood from the erectile tissue, but a slow-continued discharge as from a large vein. This was controlled by means of a sponge and bandage. A gradual suppuration, with apparent elimination of the sac, which had formed around or been pushed before the foreign body, followed; and the patient recovered in the most satisfactory manner. The case is important from its rarity, and for the practical facts which it teaches in regard to the danger from interference with the erectile tissue, which at first would appear likely to be more considerable.

CASE CCCXXXI. — *Gunshot Wound, cutting off the Vertebral Artery.* — Cornelius Mahoney, 11 years of age, was brought into the Hospital on the 25th of May, 1861, having received the charge of a pistol, loaded with stones, accidentally fired by a companion. One of the stones grazed his forehead, a second struck him on the cheek, and a third penetrated the neck, about half an inch below the mastoid process of the temporal bone. He received the charge while in a stooping posture, and was taken up bleeding profusely. When brought into the Hospital, the bleeding was nearly checked; water-dressings were applied, and the patient kept very quiet. I saw him on the following morning; and, as there was a disposition to hemorrhage, he was etherized, with the object of removing the foreign body, if there was one, and checking the bleeding. A finger passed

into the wound penetrated deeply into the neck, and finally encountered what at first appeared to be a mass of gravel; a portion, however, being removed with the forceps, showed it to be bone, and what afterwards proved to be the transverse process of the second or third cervical vertebra. The hemorrhage now returned violently, and but little doubt existed that the vertebral artery had been cut off. A systematic plugging with small bits of sponge was made, and the bleeding checked. On questioning the father of the boy, it was ascertained, that, while they were engaged in arresting the bleeding at his house, with a handkerchief, a small pebble was discharged into it, driven out by the great force with which the blood gushed forth.

29th.—He had passed a pretty good night, and was free from pain, except in his left shoulder. Pulse reduced from 140 to 120. Towards evening, he became somewhat delirious. He remained in this condition for eight days; pulse ranging from 120 to 140, feverish, and at times out of his head. On the 4th of June, he was somewhat better. The bandages had been cut off, and the sponges removed from the wound, on the 2d. On the afternoon of the 4th, a sudden hemorrhage took place from the wound, amounting to eight ounces, and producing great depression: assistance being obtained, it was checked at once by plugging with sponges.

On the 6th, at two o'clock in the morning, a third bleeding occurred, which was promptly stopped, about two ounces of blood only being lost. Some of the old sponges were removed, and replaced by fresh ones, dipped in the solution of the perchloride of iron. From this time, he lost no more blood, and the wound supplicated well, the sponges being all removed on the 10th. From the attendant inflammatory action, his head was drawn down to that side, but gradually righted after the wound had fully healed. Before he left the Hospital, which was on the 22d, a piece of bone was discharged, which, on examination, appeared to be the end of the transverse process of one of the cervical vertebræ.

He was seen a month afterwards, perfectly well.

CASE CCCXXXII. — *Compound Fracture of Skull from Pistol-shot. Loss of Cerebral Substance. Death five days after.* June 4, 1861, a man, 54 years old, was found lying in a shop, having attempted suicide with a pistol. The ball had entered the head at about the middle of the right temporal fossa, making a large, irregular wound.

Under ether, six hours after the wound was received, efforts were made to find the ball, and remove it. The wound was enlarged, and a pair of dressing forceps passed in, which met with no resistance until the opposite side of the cranium was reached. The ball could not be found. A piece of the roof of the right orbit, however, was extracted, which had been driven into the brain. The examination was made with great care, and occupied but a brief time.

After the effect of the ether had passed away, the patient remained in a semi-conscious condition, but answered questions rationally when aroused. There were no signs of local or general paralysis, except in the upper eyelids, which were fallen, and the eyes, which were protruding and fixed. The urine was passed without difficulty. The patient stated that he could see. In the evening, the eyelids became very much ecchymosed and swollen; and about a tablespoonful of cerebral substance was discharged from the wound. During the night, he had several attacks of general subsultus: pulse 120, soft and regular. Brandy and water was given.

5th. The subsultus diminished in frequency and severity: pulse 92, mind clearer. Has taken nothing but brandy and water.

6th. Passed a quiet night; pulse 100, milk-punch ordered.

7th. Rather weaker last night; pulse 100, respiration 36, subsultus increasing, enema ordered.

8th. Very restless last night, trying to get out of bed; subsultus less, pulse 112, respiration 28, tongue dry; still says that he can see, but unable to raise eyelids. In the evening, he began to grow weaker, and sank into a comatose condition. After five o'clock the next morning, he failed rapidly, and died at half-past seven.

The following is the report of the autopsy, made by Dr.

Ellis : " Head, — dura mater of a reddish color, particularly at the posterior part ; considerable bloody serum between the dura mater and arachnoid ; large amount of blood beneath the arachnoid ; no flattening of the convolutions, swelling, nor other appearances of inflammation. The anterior portions and base of both hemispheres above the orbits were extensively, but not deeply, lacerated ; a thin layer only being softened and mottled on the confines of the injury. A small fragment of bone and a bullet were found in the bruised layer.

" A small portion of the left hemisphere outside of and above the lateral ventricles was softened, and filled with red points. A large opening existed above the right zygoma. The right orbital plate of the frontal bone was nearly destroyed, and the left badly fractured.

" The surface of the ethmoid bone was also injured. An irregular portion of lead was found among the fragments of the left orbit. A fracture extended from the large opening on the right side, across the frontal bone."

CASE CCCXXXIII. — *Remarkable Case of a Breech-pin, lodged in the Nasal Fossæ for a great length of time. Fissure of the Hard Palate. Operation. Cure.* — A man, 35 years old, came under my care, who, seven years before, while shooting, had his gun explode ; the breech-pin flying off and penetrating the head, producing a severe wound. The eyeball was destroyed, the upper part of the socket crushed in so as to expose the brain, and an opening made in the back part of it, communicating with the nasal fossæ. His recovery was very slow ; and he suffered much from pain in his head, and vertigo. The nose was obstructed, so that he was unable to breathe through it.

Fourteen months afterward, a soreness was felt on the hard palate, and a foreign body seemed to close up the fauces. An investigation, being made, disclosed a screw projecting through the roof of the mouth. An incision was now made through the soft palate, by his medical attendant ; and the whole lost breech-pin, with the screw attached, was extracted. The model of the breech-pin, made by the patient himself, is now in my

possession. It is three and one-quarter inches long, and three inches in circumference.

The condition of the patient, when he entered the Hospital, was as follows: There was a fissure in the palate; the eyeball was gone; the eyelids, apparently uninjured, remained open; there was an opening at the back part of the socket, communicating with the nose and mouth; the upper edge of the socket was irregular, where the bone had been destroyed, and the brain exposed. He could not speak intelligently without pressing his finger into the socket, and closing the lids, so as to prevent the passage of air through from the mouth. Even then, on account of the fissure in the palate, it was not easy to understand him. Swallowing was difficult, and required a certain position of the head to effect it. The first indication seemed to be to obstruct the passage of air through the socket. To effect this (the patient being etherized), the tarsal cartilages of the eyelids were removed, the cut edges brought together by sutures, and collodion applied. His speech was at once improved by this operation.

The following week, the fissure in the palate was operated upon. It required much dissection to bring its edges in contact, on account of the callous and unyielding condition of the soft parts. This was, however, finally effected, and the whole fissure closed.

The first operation on the palate failed, from the patient's having persisted in chewing tobacco, and eating solid food. A repetition of it, however, with better behavior, was attended with success. The eyelids united, with the exception of a very small aperture, which, for a long time, resisted all attempts to close it, and gave issue to a glairy fluid, supposed to come from the remains of a portion of the lachrymal gland. The hole was finally reduced to so small a size that no air could pass through it. The patient left the Hospital quite well, with his voice almost completely restored.

Dr. Henry G. Clark has kindly furnished me with the notes of the following case, which I saw at the Hospital:—

CASE CCCXXXIV.—*Gunshot Wound in the Back of the Neck. Loss of Bone from Spinal Processes. Extraction. Recovery.* — "The patient, Captain G., was wounded at the battle of Chickamauga, Sept. 19, 1863, by a Minié-ball, which entered the neck at the upper part, over the spine, passing forwards to the right until it found a deep lodgement under the right ear. Oct. 14, 1863, he entered the Massachusetts General Hospital.

"He was a stout, healthy man, but had been suffering much from swelling and inflammation along the track of the ball, and down the neck under the angle of the jaw. There was a fistulous opening and a cicatrix behind the ear, the point at which several unsuccessful attempts had been made to extract the ball.

"The patient being etherized, and the fistulous opening enlarged, the track of the ball was explored with the finger and forceps; and several small pieces of bone from the spinous processes, and bits of cloth, were removed. The base of the occiput was discovered to have been grazed; but the ball could not be found. An incision was then made into the fistula, below the angle of the jaw, and the ball found lying two inches below, in a sort of pouch, directly over and upon the carotid artery, and extracted by the forceps. It was grooved from point to base by attrition. From the extent and hardness of the swelling, the ball could not be felt externally.

"The wound was thoroughly cleansed; and the patient left the Hospital on Oct. 19th, rapidly convalescing, and afterwards wholly recovered."

CASE CCCXXXV.—*Gunshot Wound of Neck. Ball extracted three months after, at Base of Neck, in Contact with Spine.* — At the battle of Fredericksburg, in May, 1863, an officer was struck, by a plunging shot, on the left side of the lower jaw; driving a portion of the bone, with three or four teeth, down into the neck, from which they were removed, some weeks afterwards, by an operation. The ball glanced down the neck, and disappeared apparently in the thorax. Some three months later, while he was partially recovering from the effects of his severe injury, a hard substance was felt, just above the

clavicle, making its way upward between the two heads of the sterno-mastoid muscle. After moving up for half an inch, it was arrested, and remained stationary for one or two months, until October, 1863, when I first saw him. During this period, he suffered from occasional pains in the left side of the chest, dyspnœa, and various symptoms indicative of nervous irritation. He was occasionally seized with severe pain in the left arm, with inability to raise it, lasting a while, and then passing off, but he had at no time the free use of the limb. On examination, the muscles being relaxed, in the depression between the two insertions of the sterno-mastoid muscle, a hard substance could be felt deep in the neck, lying on the bodies of the vertebræ, and receding a little on pressure.

The patient was etherized with great difficulty, it being one of those cases in which the ether causes great irritation of the lungs; and it was only after a struggle of ten or fifteen minutes, that he became sufficiently quiet, from his cough, to allow the operation to proceed. The veins of the neck were, in consequence, much distended with blood.

An incision was made, just on the outside of the great vessels, two or three inches in length, dividing a large vein in the course of the dissection, by which a slight delay was occasioned, chiefly owing to the struggles of the patient in breathing, and from fear of absorption of air in the violent movements of respiration. It was, however, soon tied, and the dissection continued downwards and to the outer side of the large vessels. The foreign body was now exposed, covered by a thick, white envelope, which was either the sac surrounding it, or the internal jugular vein lying empty and flattened over it. A hole was therefore carefully scratched in it, when a quantity of white milky substance escaped, showing that the ball had been contained in a cyst or sac. The opening was then enlarged, and the bullet pried out from its lodging-place by the aid of a forceps and director. On passing the finger into the sac, it was found to reach the bodies of the vertebræ. The bullet, a conical one, was flattened on the side where it had impinged on the bone; and the cup-shaped cavity in its base was filled with a thick white paste, looking somewhat like mortar. It had

apparently penetrated the chest to a certain extent, perhaps ploughing up the pleura, and had then gradually worked its way upwards, until it had reached the spot where it was found encysted. After a few days, during which there was some difficulty of swallowing, recovery took place without other untoward symptoms.

He visited me, a year afterwards, in a good condition of health.

CASE CCCXXXVI.—*Wound of Chest from Pistol-balls. Death eight years after. Pistol-balls suspended within the Chest by the Pleura.*—In a fit of jealousy, a man shot his mistress, coming behind her while she was sitting on a low bench, and firing down upon the chest. He then placed a pistol to his heart, and pulled the trigger. In the act of discharging the pistol, the muzzle became a little elevated, so that the bullets just escaped the heart and great vessels in their passage through the chest. Both these patients came under my care at the time.

The woman lived three days, and then died in great agony. On a post-mortem examination, it was found that one of the bullets had passed through the cavity of the chest, and lodged in the body of a dorsal vertebra. This vertebra I now have, with the ball deeply embedded in it. A second bullet struck the first rib, was cut in two by it; one half traversing the top of the rib, the other traversing the lung, being found loose in the cavity of the chest. The hemorrhage produced by this wound filled the chest, compressed the lung, and was the immediate cause of her death. The third bullet entered the neck, and its course could not be traced.

The man, immediately on being wounded, had great emphysema of the walls of the chest, followed by entire flatness on percussion of that side. After a very severe illness, he recovered sufficiently to be brought to trial; and, being convicted, was sentenced to the State Prison for life.

I saw him at the prison about four years after. He then had a constant, dry cough. On auscultation, the respiration was found rough on the left side, and somewhat bronchial. There

was no râle. Percussion revealed nothing abnormal. His health was otherwise good.

He died suddenly, eight years after the crime was committed. On examination, it was supposed by Dr. Morris, Surgeon to the Prison, that some disease of the heart would be found to explain his death. No sufficient disease, however, could be detected. The valves of the heart were thickened, but not enough to impede their action. In the upper lobe of the left lung, a cicatrix, showing the course of the balls, was distinctly visible. The balls, having traversed the lungs, had lodged in the side of the chest. From this place, they had become gradually detached, and were found suspended from the sides of the chest, like cherries hanging from a tree, having carried the pleura before them, and being enveloped in that membrane.

CASE CCCXXXVII.—*Gunshot Wound of the Abdomen, followed by Intestinal Fistula. Recovery.*—At the battle of Chancellorsville, May, 1863, a strong healthy man, 25 years of age, was struck on the right of the abdomen near the umbilicus by a musket-shot fired from an elevation. It penetrated the peritoneal cavity, passed through the pelvis, and came out through the middle of the right ilium. No very severe peritonitis occurred, and it was not until after several days that fecal matter appeared at the wound of exit. Pieces of bone were occasionally discharged from the same aperture. After several months, this wound healed, and discharges of pus and feces came away from the wound of entrance, in the front of the abdomen. I first saw the patient in January, 1864. He was in good health and spirits, with the exception of the annoyance from the wound just described, and a lameness in the right lower extremity, resulting from it. A small bougie, introduced into the wound, penetrated about eight inches in an oblique direction, when it encountered dead bone in the neighborhood of the pelvis. After one or two explorations with the bougie, a long pair of slightly curved forceps opening only at the extremity, and made of two branches rolling on each other, was carefully introduced, the edge of the bone seized, and small fragments of it removed. From a fear of wounding the intestines, however, the operation

was not persisted in. A poultice was applied to the cicatrix on the hip, which was thus made to open again; and, through a narrow callous fistula, the bone could be felt, by the forceps, somewhat beyond the reach of the finger. Portions of bone were again removed: but, as the main fragment seemed to be angular in form, and was in the immediate neighborhood of the cæcum, in which part of the intestine the opening probably existed, no further attempt was made; the case being evidently one in which great caution was necessary.

Early in March, the wound of exit was dilated so as to allow the forefinger to penetrate its whole length through the fistulous passage; but the dead bone could not be reached. The forceps, being passed in, would occasionally grasp the edge of the bone, which seemed to be attached to the pelvis, and involved in the folds of the intestine, from which it was dangerous violently to remove it. It was therefore decided to leave the case for the time to nature, with the hope that the fragment might escape *per vias naturales*.

A few days after the last exploration with the forceps, a probe was introduced, and it was found that the fragment of bone had wholly disappeared. Forty-eight hours later, on visiting the patient in the morning, he, in great delight, held up a piece of bone which he had passed the day before from the rectum, without pain or impediment to its passage. The fragment was semicircular in form, comprising a portion of both the inner and outer surfaces of the ilium, and measured about two inches in length, by three-quarters of an inch in breadth, looking not unlike a portion of the first rib. The discharge from both apertures at once diminished; and, at the end of a week, they were almost closed. He left the Hospital, March 28th, being advised to maintain the horizontal posture, and avoid much motion until the wound had become perfectly sound, and all danger of tearing through the adhesions was over.

I saw this patient, in 1866, in a complete state of health. His wounds were healed, and no functional disturbance dependent upon them remained. I questioned him particularly as to colic, or other symptoms which might arise from a contracted intestine, but could discover nothing.

CASE CCCXXXVIII. — *Bullet passing through the Elbow-joint, and lodging in the Knee-joint. Recovery.* — A young officer, 25 years of age, while stooping down, at the battle of Antietam, to tie his handkerchief around the thigh of the man next to him, who was bleeding to death, his leg having been carried away by a cannon-ball, received a shot, which passed diagonally through his elbow-joint, and entered and lodged in his knee-joint. The elbow, at the time, was bent; and, from the position he was in, laid flat against the knee-joint. A great spout of blood at once took place from the inner wound in the arm, indicating that some large vessel had been cut off. He checked the hemorrhage with a leather strap, buckled tight around his arm. Of forty in his company, all but ten were killed or wounded. He limped off, on his injured leg, to the nearest ambulance station, where the wound in his knee-joint was examined by a surgeon. The probe penetrated the joint freely; but the ball could not be detected. From the strongly bent position of the limb, it had apparently escaped the tibia, and passed in between the condyles of the femur, where it was securely lodged and concealed. His arm and leg had water-dressings applied, and were put in splints; and he was immediately placed in the cars, and transported to Boston, where he arrived in the course of a week, with many other soldiers, some of whom had received equally serious wounds, and to whom the danger of transportation, except under existing circumstances, would have been considered almost a fatal movement.

When I saw him, he was in an extremely feeble condition. Belonging to a fresh body of troops, he had been marched, some days before the final battle, and fought for one or two days before, subjected to great heat; his principal nourishment being green corn, which produced an almost constant diarrhœa. It is probable that to this condition he owed his safety. In addition to the above wounds, he was suffering from a contusion of his side.

The knee-joint, I found, was free from pain and inflammation, but the wound on its outside slightly suppurated. It was dressed with a ham splint, and kept in a state of entire rest. On examining the elbow-joint, I found it quite loose, both condyles broken

off, the joint swollen, with an effusion on the inside, a bullet-hole below the joint on the outside, and above it on the inside. The elbow was made immovable with splints: and, after a moderate amount of inflammation, which at no time amounted to any thing threatening, both the knee-joint and the elbow-joint did perfectly well; so that, at the end of two months, he was able to go out of doors. He finally recovered all the motions of the elbow-joint. Now, at the end of four years, he walks without the least sign of lameness, the ball still remaining in the knee. The power of entire flexion of the leg only is wanting.

CASE CCCXXXIX. — *Pistol-ball passing through Lungs. Recovery.* — Some years since, a man was brought into the Hospital, who had received, from a pistol in careless hands, a shot, which passed directly through the right side of the chest, and lodged under the integuments of the back. When I first saw him, he was breathing with difficulty, in a deadly faint condition, his head having fallen on his chest; and he was spitting up freely frothy blood. He was very much depressed in mind, desired his wife to be sent for, and seemed to feel that his dissolution was near at hand. I endeavored to encourage him as much as possible; and, after having administered stimulants to bring up the circulation, removed the bullet from his back, and stopped the action of the chest by broad strips of adhesive plaster carried two-thirds around the body. He eventually recovered, after an attack of pleuritis and pneumonitis.

The history of this man was a curious one. He had been to California on a gold-hunting expedition; and, while there, had imagined that he could turn the waters of a small stream or river by means of an India-rubber tube, and thus expose the golden sand beneath. For this purpose, he had returned to Boston, and had caused to be manufactured such a tube, a hundred feet long, and six or eight feet in diameter. This had been nicely packed on board a vessel; and he was on the point of sailing on his return, when the captain of the ship, playing with a pistol, accidentally shot him, as above related.

CASE CCCXL. — *Amputation of Thigh for Gunshot Wound, producing Fracture and Distortion of Thigh, and Anchylosis of Knee-joint. Appearance of Bone removed.* — May 24, 1866, a young man, 20 years of age, entered the Hospital to have his leg amputated for gunshot wound of the thigh, received three years before, which had broken the thigh, and left it in a state of necrosis. The ball struck him in the back part of the thigh, rather below the middle, from which place a number of pieces of dead bone were extracted at the time. During the confinement, the knee-joint became ankylosed. About a year before, he had an attack of erysipelas in the leg: and six months after, while jumping from a step, he struck his knee, and had not been able to use the limb since; a distinct snap being heard in it at the time. There were some signs of a tuberculous deposit in his lungs. His left leg was shortened about five inches; knee ankylosed; the middle portion of femur was thickened, as if large quantities of bone were thrown out there. On the inner side of thigh was a cicatrix marking the point of entrance of the ball; on the outer, one showing the point of egress, and a sinus, with dead bone, could be felt at this point.

On the 29th of May, the thigh was amputated by small, oval, anterior and posterior flaps of skin; the muscles being divided at the base of these by a circular cut. This patient recovered so as to be able to leave the Hospital in about four weeks. The following were the appearances of the limb removed:—

The knee was bent, and the inner condyle ankylosed to the tibia, and the patella to the femur. The femur, where it had been broken by the ball, was overshoot about three inches. In the upper part of the lower fragment, which was behind, was a circular aperture the size of a musket-ball. Masses of lead were here everywhere embedded in the bone.

CASE CCCXLI. — *Case of Gunshot Wound in the Groin; the Ball lodging on the Capsule of the Hip-joint, and under the Great Vessels. Extraction three weeks afterwards. Recovery.* — Captain H. M., 23 years of age, at the battle of Gettysburg, on the second day, was stationed with his regiment

in the Second Division, Second Corps, on the crest of the ridge occupied by the left centre of the army. During the morning of the third day, the enemy had massed his artillery opposite this front ; and, at one o'clock, opened upon it from 145 guns in position, for the purpose of clearing the way for the advance of his infantry. Our batteries replied, and a most terrific cannonade was kept up for nearly two hours, after which the assault was made ; and, the head of the enemy's column having penetrated, and obtained a lodgement, within our lines on the right of the regiment, the latter was ordered to change front obliquely to the right and rear, in order to meet it, and check its further advance. In this movement, and at short range, this officer received a bullet in his groin, at once disabling him. He was carried to the rear, where his wound was examined by a surgeon. It was probed, and a finger introduced ; but no traces of the ball could be found. He arrived in Boston about a week afterwards, in a state of great suffering. The wound was a little below Poupart's ligament, the swelling not excessive, but the motions of the joint extremely painful.

He was placed in a position where the limb could have the most perfect rest, and applications used to reduce inflammation ; but, after two weeks, symptoms of acute inflammation of the hip-joint coming on, and the pain becoming almost excruciating, I cut down and removed the ball, which had taken somewhat an irregular course, lying directly upon the capsule of the hip-joint, which had not, however, apparently been penetrated. The patient was then put upon a fracture-bed, composed of a triple inclined plane placed on a second plane, similar to the one used in a case of fracture above, so that the whole body could be moved without disturbing the joint. In this position he remained for many weeks, being unable to allow any one even to touch the bed without experiencing great suffering, and requiring the use of ether when his clothes were changed.

At the end of one or two months, the inflammation having subsided, I broke up the adhesions to the joint, while he was under the influence of ether. He did well, and got on crutches ; but, from an accidental fall, not being sufficiently careful in the

use of his crutches, the joint was wrenched, and the inflammation reproduced.

He ultimately recovered with a completely straight limb, but stiffened hip-joint, being unwilling to submit to the confinement and uncertainty offered by another operation to loosen it.

CASE CCCXLII.—*Gunshot Wound. Fracture in Right Femur, at its Upper Third. Great Suppuration. Confinement for nearly a year. Great Distortion. Operation for Necrosis. Subsequent Death from Exhaustion.*—A distinguished officer of artillery was shot before Petersburg, June 18, 1864, by a Minié bullet, which passed through his left thigh, and penetrated the right, near the fold of the nates. He was carried to a Hospital; and, at the end of four weeks, the bullet was extracted. He suffered much from his wounds, and from bed-sores, which formed on his back. At the end of four weeks, he was taken to his home in Maine, in an exhausted state, where he began shortly to improve. Four weeks after this, while endeavoring to turn in his bed, he heard a loud snap; and immediately his right foot became inverted, and his thigh shortened two or three inches. In this condition he remained until May, 1865, nearly ten months and a half after the receipt of the injury, when he was brought to Boston, and placed in a private room at the Hospital, under my care. He was then very feeble, with a great discharge from the wound in the outer and upper part of right thigh, and apparently failing. The foot was strongly everted, the limb shortened, the knee-joint partially ankylosed, and he could not be moved in bed without the greatest difficulty. He was kept alive only by means of food of the most nourishing character, and large quantities of stimulants.

A consultation being held on his case, the question was proposed whether to amputate the limb near the hip-joint, or to make an attempt to remove the dead bone; and it was decided to attempt the latter. On the 7th of May, a free incision was made on the outside of the thigh; and a large sequestrum, locked in between the upper and lower fragments, was successfully removed. On removing the sequestrum, it was found that

the upper and lower fragments touched each other, but were united only for a space of about a quarter of an inch in circumference. It was therefore decided to attempt to remedy the great deformity and shortening which existed. This was done by slightly twisting the foot, and the adhesions easily gave way. The foot was then brought up into a proper position, and, by extension, the shortening reduced to one inch. The limb was next carefully secured by splints and bandages, and the patient transported to his bed. He passed a comfortable night, and for a time seemed to improve. Two weeks afterward, however, he had some hemorrhage from the wound. He gradually failed, being worn out with the combined effects of suppuration, bed-sores, and the bleedings which occurred, — which last, under other circumstances, would have been of no consequence, — and died May 28th.

Autopsy. — The upper fragment, about five inches in length, was turned outwards and downwards; and, at about two and a half inches from its apex, there was a rough, irregular surface, the seat of its attachment to the lower fragment before the operation. Its contour was quite irregular, and showed signs of previous disease, as also the marks of pressure made by the pointed end of the lower fragment. The latter was very irregular in aspect, having cavities left by the removal of the sequestrum. The interior of the bone was completely disintegrated for some four or five inches, a sanious discharge oozing from it. The angle made by the two fragments was very strongly marked. The adjacent part of the thigh was completely riddled with burrows, one of which extended as high up as the crest of the ilium.

CHAPTER XIII.

MISCELLANEOUS CASES.

PENETRATING WOUNDS OF THE CHEST AND ABDOMEN.

THESE are rare in civil practice, but I have met with several dangerous wounds implicating the cavities of the chest and abdomen, — more especially the former, — which, contrary to the usually received opinion, have recovered under judicious care and management. Since the war, important discussions have been held on this subject; and in cases, for instance, where balls had passed through the chest, followed by recovery, the diagnosis has been questioned. I was glad to find, however, that many distinguished surgeons had been brought to the same conclusions, in the great field of inquiry which was offered to them by the war, that I had already arrived at by the small experience in these wounds presented by civil practice.

The experience of the late war also shows, contrary to the popular opinion, the rarity of wounds by the sabre and the bayonet. Out of 87,822 wounds that were classified, there were 106 sabre wounds and 143 bayonet wounds: 11 died of the former, and 6 of the latter, making 17 in all.

Guthrie, one of the most distinguished of English military surgeons, testifies to the great rarity of this description of wounds.

In illustration of the above remarks, I would quote from Circular No. 6 the following results of gunshot wounds in the chest; and although it may be said that these wounds are different from wounds made with a pointed weapon, yet the danger would be in favor of the former: —

“Of 7,062 gunshot wounds of the chest which have been examined, and transcribed from the reports belonging to the period prior to July,

1864, there were 2,303 that either penetrated the thoracic cavity or were accompanied by lesions of the thoracic viscera. The results have been ascertained in 1,272 of these, and were fatal in 930, or 73 per cent. The 4,759 flesh-wounds presented a very small ratio of mortality. It was observed, however, that they were commonly long in healing, in consequence, no doubt, of the mobility of the thoracic parietes.

"Of 2,707 gunshot wounds of the abdomen, reported from the beginning of the war to July 1, 1864, there were 2,164 flesh wounds, and 543 cases in which the peritoneal cavity was penetrated, or the abdominal viscera injured. Among the flesh-wounds, 114 fatal cases are reported, which were, in most instances, cases of sloughing, from injuries of the abdominal parietes by shells. Of the 543 penetrating wounds, the results have been ascertained in 414, and were fatal in 308, or 74 per cent. The number of recoveries is unexpectedly large, but includes only cases in which the reports showed, beyond question, that the abdominal cavity had been involved."

The following cases, which happened to be in the Hospital under the care of my colleague, Dr. H. G. Clark, and myself, in June, 1859, (the notes of which I made immediately afterwards,) are cited in confirmation of what I have now said:—

CASE CCCXLIII. — *Stab in Abdomen. Recovery.* — The first case was that of a young woman, about 25 years of age, under the care of Dr. H. G. Clark, who, about a month before, received a stab on the upper and left side of the abdomen from a drunken soldier. The knife cut through all her clothes; made an incision from three to four inches in length in the upper part of the abdomen, through the skin, fat, and muscles; and apparently penetrated the abdominal cavity. The wound was brought together by stitches, and the patient sent to the Hospital, where she arrived in a state of great exhaustion and suffering.

A few days after her entrance, the wound was attacked with erysipelas; and she underwent a very critical inflammation of the abdominal parietes. The peritoneum, however, seemed to escape; and she recovered well.

CASE CCCXLIV. — *Stab in Chest. Recovery.* — The second case was a sailor, about 25 years of age, also under Dr.

Clark's care. About two weeks before, in a drunken fray, he received a stab from a large knife in the chest between the sixth and seventh rib of the right side, also a second stab in the upper part of the abdomen. He was at the time suffering under an attack of an asthmatic nature. The wound in the chest penetrated through the ribs, cutting off the inferior intercostal artery, which bled furiously, and, when he entered the Hospital, could only be stopped by thrusting a bit of sponge into the wound between the ribs. This effectually stanching the bleeding. The wound in the abdomen gave no symptoms. At the end of three days, a poultice being applied over the sponge, it softened and came away without hemorrhage. The patient during this time was very asthmatic, and the action of the lung on that side seemed nearly suspended. He expectorated freely a muco-purulent matter, but attributed his symptoms principally to previous disease, and recovered without further bad symptoms.

CASE CCCXLV. — *Stab in Neck and Abdomen. Recovery.* — The third case was that of a young man, 19 years of age, who, the day after leaving the House of Correction, engaged in a brawl, and received a stab in the left side of the neck and upper part of the abdomen. The omentum escaped from the abdominal wound, but, being returned by the physician first called, the wound was sewed up; and this, as well as the wound in the neck, which had cut through the mastoid muscle without injury to any important artery or nerve, was closed with adhesive plaster.

The patient was placed on his back, kept on oatmeal gruel, and no medicines used. He had no tenderness of the abdomen, no fever, and, at the end of a week, appeared perfectly recovered. I kept him very quiet, from fear lest adhesions formed between the omentum and abdominal parietes might be torn away, and serious symptoms induced by too early and too active movements.

CASE CCCXLVI. — *Stab in Chest. Recovery.* — The fourth case was an Italian, 20 years of age, stabbed in the chest

by a drunken man. The wound was large, and appeared quite deep : it was situated just on the edge of the false ribs. Either from fright or bleeding, the patient, when first brought into the Hospital, had the aspect of having received a mortal wound. But on the following day, no symptoms in the lungs having appeared, I was convinced that the knife had passed between the integuments and ribs, and that the viscera of the chest and abdomen had escaped injury. I did not, however, make any examination, in this or in the other case, with a probe, — a practice which I consider unnecessary, intermeddling, and, I may almost say, criminal ; as it might in some instances complete the passage of the wound into a large cavity which otherwise might have escaped, or the screwing of the probe round in the chest or abdominal cavity might of itself be productive of serious consequences.

This last patient also did well.

HIP AND SPINAL DISEASES.

The present improved method of treating hip and spinal diseases may be adduced as one of the greatest triumphs of the modern school of pathology. Hip-disease, as every one knows, was formerly treated almost exclusively as a local inflammation ; and the patient was confined to his bed, tormented in turn by the severe pain caused by every motion of his diseased joint, and by an appalling routine of leeches, cups, blisters, setons, and issues. Dr. Physick, of Philadelphia, demonstrated the great importance of rest ; which he secured by means of the "carved splint," accurately fitted to the hip, and confined by bandages. The carved splint is, however, an expensive appliance ; requiring to be made expressly for the case in which it is to be employed. The full benefit, therefore, of this treatment was only realized after the introduction of splints of gutta percha, at the Hospital, some twelve or fifteen years ago. The rest thus secured by the immobility of the apparatus affords immediate relief from pain, and, with the aid of baskets which I have had made for the purpose, admits, even in bad cases, of the patient's being readily carried into the open air,

or even transported great distances. The recent invention of the improved instruments of Drs. Davis and Sayre, which, in many cases, admit of a moderate degree of locomotion, has given a new impetus to the treatment of this disease; avoiding, in even a greater degree than before, the injurious confinement in bed to which the patient was formerly condemned. In those cases where no splint can be borne, great relief is experienced either by the application of a simple weight attached to the foot, or the extension apparatus of Desault, to separate and prevent friction of the inflamed surfaces. The constitutional treatment must, of course, be directed to the preservation of the strength during the course of a long and tedious disease; and it is by the mechanical appliances just mentioned that we are enabled to avail ourselves of the inestimable benefits of fresh air and gentle exercise, so essential to the maintenance of health both of body and mind.

Caries of the spine naturally falls into the same category as hip-disease. Mechanical support should be given to the back, in order to prevent the breaking-down of the inflamed vertebræ from the weight of the upper part of the body: the patient is thus enabled to move about, and preserve a fair degree of health during a long and trying disease.

Many scrofulous affections of the knee, and other large joints, are to be treated according to the same principle; sustaining the system by invigorating remedies, and securing immobility of the affected joint by proper mechanical appliances.

It is still a question how far we can safely venture in attempting to destroy the adhesions, and consequent immobility, caused by disease of the hip and other large joints. Some experiments have been tried, with a view to deciding this point; but the rule of practice is, as yet, by no means settled.

I have, however, seen in the practice of Dr. B. Brown, of this city, and assisted him in the operation upon, a number of cases of children suffering under false ankylosis of the joint, the sequel of hip-disease, in which the adhesions have been broken up under ether with gratifying results.

The diagnosis of incipient hip-disease is a subject of much importance, and sometimes a matter of considerable difficulty,

there being such a variety of symptoms connected with it. Generally, there is a pain in the knee-joint ; sometimes, though more rarely, in the hip itself. In others, there is a complete immunity from pain, and the only symptom is lameness. The following method, for clearing up this point, I have seldom known to fail : —

The patient being laid upon the back, and the limbs well relaxed, the sound limb is first seized, and freely bent until it nearly or quite touches the abdomen. The same manœuvre being attempted with the other limb, it will be found that the flexion of the limb is almost invariably arrested at or near a right angle with the body ; though I have seen one or two exceptions to this rule. If the flexion is complete, and if, added to it, there is no pain from deep pressure in the groin, the cause of the lameness may be searched for elsewhere.

A question, which has been much discussed, is, why is the diseased limb apparently lengthened in some cases, and shortened in others. So far as I have observed, the following is the explanation : When the disease comes on insidiously, and with but little pain, so that the patient is able to keep about, the limb is carried in front of the other in walking ; and the pelvis, in this way, gradually becomes depressed. When the affection is acute, and attended with much suffering, the patient lies in bed on the sound side, drawing up the affected limb ; that being the most comfortable position in this, as in some other inflammatory affections of the lower extremities.

Hip-disease is not unfrequently mistaken in children for dislocation of the hip-joint ; and I have had a number of cases under my care, of patients who have suffered an aggravation of their disease from attempts having been made to reduce a supposed dislocation, the symptoms of which had come on not long after the receipt of a fall. The diagnosis is at once cleared by the use of ether, which relaxes the irritated muscles, and removes the distortion.

I do not propose to adduce cases in illustration of this very common affection, but would reiterate what has already been said in regard to keeping the joint in a state of perfect rest, by such appliances as will allow the patient to enjoy the invigorating influence of the open air.

APPENDIX VERMIFORMIS.

CASE CCCXLVII. — *Gangrene of the Appendix Vermiformis.* — 1851, June. The patient, a gentleman 40 years of age, had always been subject to what are called bilious complaints. About four years before, he was confined for some weeks to the house by a severe attack of colic, attended with constipation, at which time I observed a small, hard tumor — tender on pressure — in the right lumbar region. Two years later, in October, he had a second attack, in which the pain was excruciating, and required the constant inhalation of ether and the use of opiates to relieve him. At this time, there was a diffuse swelling in the right iliac and lumbar regions, quite hard, and very tender. Under the use of leeches, and by inducing a slight mercurial action on the system, he slowly recovered. Fearing some organic complaint, not only from the swelling, but from his great susceptibility to cold and disturbed digestion, I advised him to relinquish business; at least so far as to allow him to have his mind perfectly free from any care, and to give him an opportunity of paying particular attention to his health. This he did, and was quite free from any trouble until the final attack, which came on after exposure to cold, and some irregularity in diet. The pain, for a day or two, amounted merely to a feeling of uneasiness, but gradually became excessive. A tumor could be distinguished at this period in the right iliac fossa, about the size and length of the forefinger: it was quite hard, and could be almost seized through the integuments, and lifted up. The pain and tenderness were so great as to require the overpowering use of opiates administered by enema.

On the third day, there was a slight evacuation from the bowels, by means of an enema; but the patient shortly after fell into a state of collapse, and died seventy-four hours after the violent seizure. For the last twenty-four hours, there was the most distressing hiccough.

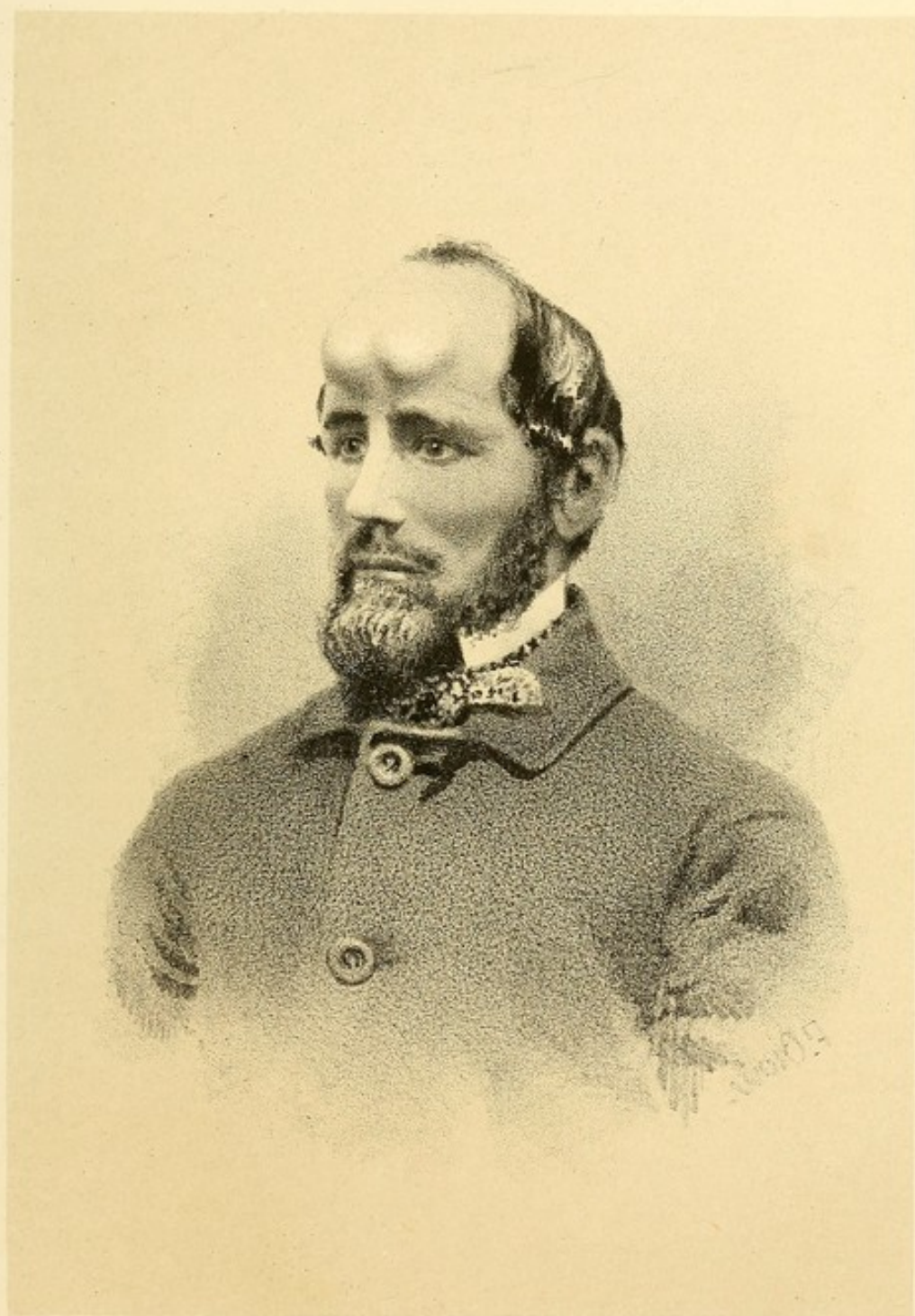
An examination, after death, revealed extensive peritoneal inflammation. There was very great induration of the omen-

tum, with firm adhesions, arising apparently from the previous attack, two years before. Some purulent matter escaped from the cavity of the pelvis. The appendix vermiformis was found gangrenous, and perforated at both ends: in its central portion was contained a mass of indurated feces, as large as a prune-stone. On section of this substance, no nucleus could be discovered.

It is well known, that small shot, apple-seeds, and various other foreign substances, lodging in the appendix vermiformis, will give rise to the above symptoms; though, in post-mortem examinations of persons dying of other diseases, these substances are often found there, not having caused any disturbance during life.

CASE CCCXLVIII. — *Necrosis of Bones of Skull giving rise to a Tumor containing Air.* (See Plate V.) — A man from New Hampshire applied to me for advice on the 28th of November, 1861. Four years before, he had received a severe blow on the forehead, from a heavy branch of a tree. Great swelling ensued, which confined him to the house for a week or ten days. The swelling gradually subsided, leaving a sensation of dull pain in the part, accompanied, from time to time, by soreness and tumefaction. In July, 1861, while at work in the hay-field, he was seized with severe headache, and other symptoms indicative of cerebral disturbance. Soon after this attack, a tumor appeared over the seat of the original injury, covering nearly the whole forehead. After a great deal of suffering, a discharge of pus took place from the left nostril, and afforded him temporary relief. Subsequently, the tumor became tense again, and was opened with a lancet, which gave vent to a small quantity of purulent matter: a second operation resulted, as he says, in the escape of blood only. His sufferings continued to increase until the date of his visit to me. At this time they were so excessive, and the constitutional symptoms of such a character, as to lead him to the conviction that his case was altogether hopeless.

The whole forehead was occupied by an elastic swelling, of the size of half of a large orange, partially divided in the centre by a vertical depression, caused apparently by the tendon of the occipito-frontalis muscle. The marginal base of the tumor





seemed to be formed by an elevation of bone, about an inch high, as if the tumor had been forced out from within the cavity of the cranium, pushing the bone before it. By pressing firmly upon the upper part of the tumor, irregular masses of bone could be distinguished; some of them loose, others forming bridges under which the fluid contents of the tumor could be forced with a gurgling sound. It was highly resonant on percussion. Air could be readily forced into it from the nostrils, and the tension thus imparted to it remained for a long time; owing, probably, to the interposition of a piece of loose tissue, acting like a valve. During violent exercise also, the tumor generally became inflated.

The diagnosis was a collection of pus, beneath the occipito-frontalis muscle, communicating with the frontal sinuses; but whether it originated from periostitis, or from disease of the diplöe, or from a tumor arising within the cranium, appeared doubtful.

Operation, Nov. 30th. — The patient was etherized, and an incision made in the median line large enough to admit the finger. A quantity of air escaped; and the finger, which was passed into the wound, detected the fact that the bone was everywhere in a carious state. The incision was then extended, and crossed at right angles by another, so as to expose a large surface of the diseased bone. The whole external table of the frontal bone was much thickened, and in process of exfoliation. A probe passed readily into the frontal sinus, and from thence, with some management, into the left nostril. The patient, on recovering from the effects of the ether, was able to force air freely through the wound. Blood escaped also into the nasal cavities. The apparent elevation of bone around the tumor was not owing to an expansion of the outer table of the skull, as at first supposed, but to inflammatory action in the soft parts; a deception similar to that which is often found to follow blows on the head, causing an appearance frequently impossible to distinguish from a depression of the bone. In the present case, the illusion was perfect. A compress was applied between the lips of the wound, which was left open to favor the separation of the necrosed bone. The patient was immediately relieved from pain, and the following night slept better than for six months before.

The fifth day after the operation, it was found possible to detach some large plates of bone, which were sufficiently movable to be taken away without violence. In the course of another week, the patient went home, entirely free from pain, and in good health: it was thought unnecessary to detain him longer in town, as the exfoliation of the carious bone would probably require a long time for its completion.

A month or six weeks later, he made a second visit to Boston, when, after considerable manipulation, another long and thick piece of bone was removed from near the centre of the os frontis. The anatomical appearance of this fragment led to the supposition that it might be made up of both tables of the skull. No bad symptoms followed its removal, and the suppuration of the wound was much diminished by it. His health appeared to be excellent.

He again came to Boston, on account of a purulent collection under the integuments of the forehead. This being relieved by an incision, loose bone was again removed.

Since the above record was made, I was consulted by him on account of a remarkable deposit in the cellular tissue in one of the upper extremities. There was a great depreciation in health, and a disposition to cerebral disturbance.

Guthrie, in his valuable work, "Commentaries on the Surgery of War," refers to a tumor of this description, and in precisely the same situation as the one above described, as follows:—

"After a wound of the frontal sinus has healed, the air has been known to raise up the integuments of the forehead into an elastic crepitating swelling, whenever the patient blew his nose, so that a compress and bandage on the part were required for its relief; but these cases are very rare."

CASE CCCXLIX. — *Poisoning by Nitric Acid. Death. Autopsy.* — A negress, 34 years of age, of abandoned character, thinking that she was three months pregnant, took nitric acid at 6, P.M., on the 3d of March, 1850, for the purpose of destroying her child. The quantity taken into her mouth was reported to be 3ij, but most of it was spit out. Alkalies and mucilaginous drinks were used; but the burning in the mouth

was intense through the night, with restlessness and delirium. The next morning she was brought from the jail, where the acid was taken, to the Hospital. Yellow stains were then observed upon the clothing, and the whole inside of the mouth and fauces, so far as could be seen, was of a deep yellow color, the tongue looking as if covered with Indian meal; the respiration being painful, labored, and stridulous, and speech almost impossible. Extremities cold, countenance of a leaden hue; pulse 120, and very small. For the first four or five days after her admission, she suffered from soreness of the mouth and throat, dysphagia, thirst, and salivation, with some vomiting: she also complained of tenderness of the abdomen, but not particularly over the stomach, walking with difficulty, and bent much forwards; but this was perhaps owing to her having been thrown down and stamped upon, in an affray, on the day on which she took the acid. After the first day or two, she was much of the time up, and about the ward; at the end of a week, she was reported quite comfortable, and having some appetite; and, on the 14th of March, as she was doing well, she was removed back to the jail, there never having been any fever, but rather a state of depression. On the morning of the 16th, she was attacked with cramps in the stomach, and excessive pain and tenderness, which were partially relieved by opiates: on the following morning, however, she was found dead in her cell, with a great quantity of blood in the bed about her, which she had apparently vomited.

On dissection, there was observed great rigidity; upon the middle of the tongue a large, yellowish, smooth patch; some redness of epiglottis; œsophagus healthy for the first two inches, but, below this, it was found exceedingly soft, of a greenish yellow color internally, purple externally, and full of coagulated blood. The stomach was in a similar, though much worse state; externally, it had the same purple color, and was universally adherent to the neighboring parts by recent lymph, except at the left extremity, where there were old and close adhesions to the spleen; internally, it was of a greenish yellow color, emphysematous, and so perfectly softened and friable that it could not be separated from the surrounding parts without giving way

in every direction, the anterior face being detached from the rest of the organ to a great extent, when the abdominal parietes were raised; its cavity was filled with recent coagulated blood, and the open orifices of several vessels were distinctly seen on the inner surface. The intestine contained blood throughout the first two or three feet, but was otherwise well, as were the other organs, so far as observed; uterus not gravid.

These symptoms are very similar to those described by Mr. Taylor as occurring from this substance. He says that poisoning by nitric acid is very rare, and that Tartra has only been able to collect fifty-six cases, extending over a period of nearly four hundred years. Death usually takes place rapidly. Out of twenty-seven cases reported by Tartra, nineteen were rapid, eight slow. Death is sometimes immediate, from its effects on the larynx. The usual period is about twenty-four hours. In one case, a patient lived three months, and, in another, eight months; in the former case, great contraction being found about the pyloric orifice of the stomach, and the duodenum equally contracted. The case now reported may be placed among those in which the fatal event was unusually protracted.

CASE CCCL. — *Painful Crepitation of the Tendons.*
— March 8, 1866, a lady called on me supposing that she had a fracture of the right radius; there being a swelling over that bone (commencing about two inches above the wrist-joint), attended with a crepitating sound on motion of the hand, which motion gave her much pain. The only cause she knew of was making an effort to raise the window of a car.

On examining the swelling, it was found to be from two to three inches long, very slightly elastic, somewhat painful on pressure, but more painful when the hand was extended. At this time, a dry crepitus could be distinguished, and felt by the patient herself, which could easily be mistaken for the rubbing together of the fractured ends of a broken bone.

I at once detected the nature of the affection, two cases of which I had described, in 1843, in the "New-England Quarterly Journal of Medicine and Surgery," and also in the "Rec-

ords of the Boston Society for Medical Improvement" in 1857, both of which are given below.

I advised her to keep her arm perfectly quiet in a sling, and foment it every night by means of a piece of spongio-piline soaked in warm water. At the end of three weeks, the symptoms had almost entirely disappeared.

CASE CCCLI. — *Painful Crepitation of Tendons.* — The patient was engaged in arranging some window-curtains. While standing on the top of a flight of stairs, from a sudden jerk her foot slipped, and the hand was caught in the curtain-rod, flexing very powerfully the wrist, with the whole weight of the body bearing on it. At the instant, she felt a slight snap on the lower and back part of the arm, near the wrist. This was followed by considerable pain and swelling, and she was supposed to have sustained a fracture of the radius. I saw her the next day. At this time the arm presented the following appearance: On the back part of the arm, just over the head of the radius, was a small swelling, a little red and painful on pressure. By placing the finger on the prominence, and flexing the hand, a distinct crepitus was perceived, which at first might be taken for the grating of bone, but, on a little examination, was perceived to be quite different; being a more dry and distinct sound, somewhat similar to the rubbing together of coarse brown paper, and compared by Velpeau to the sound which we hear from the rubbing together of inflamed serous membrane, — the pleura, for instance. The sensation is at first quite startling, and is distinctly perceived by the patient, and, when once discriminated by the surgeon, is not easily forgotten. In the present case, the greatest crepitus was heard, and the most pain caused to the patient, when the thumb was flexed.

A number of explanations have been offered as to the cause of the crepitus. The most reasonable, and undoubtedly the true one, is that of Velpeau, which is the friction of the tendon against the dry synovial sheath; its fluid being deficient from the inflammation consequent on the injury. Somewhat a similar grating sound is often perceived by moving the patella in a certain stage of synovial inflammation of the knee-joint. The

disease is most frequently found in persons whose occupation produces a great strain on the joints, such as blacksmiths, stone-cutters; also in washerwomen, being caused by twisting clothes. It occurs in the ankle as well as in the wrist joints. The disease yields to treatment in about ten or fourteen days, as in the present case; no pain or crepitation being perceptible after a fortnight.

CASE CCCLII. — *Painful Crepitation of Tendons.* — A woman employed in wringing out clothes was seized with a severe pain in the back part of the arm, near the wrist, which became swollen. I saw her on the following day. A swelling and redness then extended up the arm toward the elbow-joint, very painful to the touch, and on motion. On rotating and flexing the hand and fore-arm, the fingers being on the injured part, the peculiar sound alluded to was perceived. It was perfectly dry crepitus, which at first might be mistaken for that of a fractured bone by one who for the first time observed it. In those cases where the accident had occurred to the long head of the biceps, it had been mistaken for a fracture of the neck of the humerus.

The symptoms lasted about fourteen days, and yielded to rest and antiphlogistic remedies.

This affection I have not seen described in any of the English surgical works: it has been treated of by Velpeau under the name of "*Crepitation Douleureuse des Tendons*," and is a disease of some practical interest.

PARTIAL RUPTURE OF THE TENDON OF THE QUADRICEPS EXTENSOR FEMORIS MUSCLE. — The complete rupture of this muscle, or rather of its tendon, is at once so patent, from its symptoms, that there is no mistaking the nature of the treatment to be pursued, and a case of it has already been given above. Partial rupture, however, of this tendon near the patella is often at first not marked by any symptoms whatever, or else by signs so obscure as to make it very difficult to determine the true nature of the accident. As instances of this accident, I would mention the following cases: —

CASE CCCLIII. — A gentleman about 55 years of age, of large and powerful frame, applied to me on the 29th of November, 1864, on account of a lameness of the right knee, of which he gave the following account. Between one and two years before, while kneeling on the sand by the seashore, he felt a sudden pain shoot through his knee. No symptoms of any consequence followed until three months after, when he began to be a little lame. There was soreness about the knee, some slight difficulty in extending the leg, and in going up and down stairs. The limb was rubbed in the usual way with liniments, &c., but without marked effect. As time went on, neuralgic pains were felt in different parts of the limb, both in the thigh and leg, and the limb became obviously more flabby and smaller than its fellow. On examining the knee, I at once discovered, just above the patella, a distinct depression or fissure, about an inch long, in the extensor tendon, and penetrating, as it appeared, through about half its substance. At this point, there was a little redness of the skin, and a puffiness not to be distinguished above the other knee. The muscles both of the thigh and leg were quite soft, and measured one inch less in circumference than its fellow. I advised the patient to wear a leather laced stocking extending from the ankle to the hip, and fitted accurately to the limb, to use a cane in walking, and to stand as little as possible; also to employ bathing and frictions. In case of an aggravation of the symptoms, I also advised him to do what he now altogether refused, — to have a splint applied, and to keep perfectly at rest. I was glad to find afterwards, that my diagnosis was confirmed by Professor Willard Parker of New York, who had previously examined the case.

CASE CCCLIV. — Several years since, a young gentleman was seen, in consultation, by Dr. J. C. Warren and myself, together with the physician of the patient, on account of an accident to the knee, which had occurred six months or a year before. In making some violent effort, a slight crack was felt in the neighborhood of the joint, followed by some lameness and tenderness. At the time, nothing could be distinguished upon examination. Various methods of treatment were tried without

effect, and the patient, becoming gradually lamer, was brought to Boston for advice. A very careful inspection of the parts about the knee revealed a small fissure, which was distinctly felt in the edge of the tendon near the patella, quite sharp, and evidently showing that the tendinous fibres had been ruptured at that point. The patient was advised to try perfect rest for the limb, to have a ham-splint applied, continuing the treatment for at least three months. This was faithfully done for between three and four months, and resulted in a perfect cure.

As I now state this case from recollection, I am unable to give with distinctness all the incidents in it; but the fact of the rupture and the result of the treatment are undoubted.

HYDROPHOBIA.

CASE CCCLV. — *Hydrophobia. Death.* — The following account was principally written from data furnished by Dr. J. Stearns, then house-surgeon to the Massachusetts General Hospital, who took much interest in investigating the facts of the case. The patient was a male child, by name Patrick Murphy, three years of age, living in Boston, and was brought into the Hospital on June 25, 1859.

Five weeks before, he was bitten by a dog six or eight months old. The animal was not thought to be rabid by the bystanders; although, on the same day, he had "snapped at and slightly bitten" a man, as was thought, from playfulness. The little boy had a cracker in his hand, which the dog attempted to seize, taking into his mouth with it the whole of the right hand, and inflicting a wound on each side of the wrist. The wound, on the anterior surface, was from half to two-thirds of an inch in length; that on the opposite side was like the mark from a simple puncture. The wounds were treated by a surgeon, who cauterized them not long after the injury, and ordered a poultice. There was no further treatment used. They were very sore, for a time, particularly the one in front; but the child continued as well as usual in his general health, and nothing remarkable occurred till a week before his admission to the Hospital.

At this time, the mother's attention was drawn to the child,

by what she called a "dulness" coming over him, followed by a "silliness and listlessness." Four days before his entrance to the Hospital was the first onset of the paroxysms, which were described as having been quite formidable: they were especially violent when water was brought near him, so that the mother was obliged to give up washing the child. He manifested a desire to take food and drink from his mother, though, on attempting to swallow, he was quite unable to effect it. For this reason, he took scarcely any nourishment for four days before he was brought into the Hospital. The preceding facts were principally obtained from the parents of the child.

On his entrance into the house, he was in a highly excited condition, tossing his head, and throwing about his limbs in every direction. He spit violently, or attempted to do so, as if his mouth was full of feathers; occasionally crying out or snapping at those about him, saying that he wished to bite them, and they must get out of his way. His eyes were very bright, his face pale, and there was a lividity about the eyelids, and generally over the whole surface, with a quivering of the lips and muscles of the face, and constant tremor of the whole body. On taking a dose of morphine, he was quieted, and the nurse prevailed on him to swallow some milk from a mug. After a time, he drank a whole mugful, and ate a small piece of cake. His manner of taking the milk was not as if he had any aversion to it, but from apparent consciousness of the effort necessary to swallow. He clutched violently at the mug, with eyeballs starting out, and the whole frame undergoing the greatest agitation. The effort of swallowing was attended with a sense of suffocation, and the corners of the mouth were strongly retracted. He exhibited the same symptoms on taking cake; and, from his great desire for both, appeared to be suffering much from hunger. A viscid discharge took place from the mouth. The urine was passed in great abundance through the afternoon and evening.

He gradually became quite calm, through the great attentions of the nurse, who seemed to inspire him with confidence, and went to bed with him in her arms, in spite of the remonstrances of those about her. He talked incessantly and incoherently,

though at times he could be understood. He seemed to appreciate much the kindness of the nurse, and told her he should bite her ; but, when she put out her arm to him, he kissed and stroked it. He had several paroxysms after his entrance, with intervals of comparative quiet ; the attacks being only of short duration, lasting about five minutes each. He became weaker as the night advanced, and, at half past 3, A.M., died in one of the convulsive attacks.

No examination of the body could be obtained.

Dr. Stearns, at my request, visited the house at which the child had resided, for the purpose of obtaining some more facts in regard to the case, but did not elicit any thing of importance beyond the preceding. He saw the wife of the man who was bitten on the same day with the little boy : the bite was said to be a very slight one, on the joint of one finger, and no blood came from it. The man promised to be at the Hospital on the following day for me to examine it, but, for some reason, did not appear. The dog was drowned, and Dr. Stearns could get no further history of it. A superstition existed with them, — of which they informed him, — that, if the dog could have been killed by one of the family, the patient would have escaped ; also, that, if the liver of the dog could have been applied to the wound, the effect would have been equally efficient, which, of course, naturally implied the death of the dog.

In connection with this case of hydrophobia, I would remark, that, about fifteen or twenty years since, I proposed, at a meeting of a society, for the purpose of obtaining information, the question whether any case of hydrophobia had ever occurred in Boston, or whether there was any tradition of one in the New-England States ; but no answer was elicited in the affirmative.

The first case reported in Boston appears to be that of Dr. Coale, in October, 1848, which was followed, shortly afterward, by that of Dr. Curtis, in Lowell, supposed to have been caused by the same dog, which had escaped from Boston, and made his way to the latter city. This was followed by other cases in various directions, running through a course of two or three

years, during which time I saw, in consultation in Brookline, a patient of Dr. Wild, and the case of a child brought into the Hospital within twelve hours after having been bitten, where the parts were freely cauterized at the time, and, within twenty-four hours from the time of the accident, cut out by Dr. Cabot. This patient returned home within four weeks, apparently perfectly well; but, by the expiration of another week, the disease appeared, and she was returned to the Hospital, with all the symptoms similar to those detailed above.

All these patients died, after three or four days' illness; the attack coming on in an average of about five weeks from the receipt of the injury.

After that period, the contagion, if it may be so called, or inoculation, seemed to have exhausted itself; and but few cases were recorded until 1859, when rumors began to be heard of its re-appearance. I have constantly had persons call to consult me with very severe bites from dogs; but, not finding from them that the animals had shown any signs of rabies, I have not thought it warrantable to apply so severe a remedy as cauterization or excision to an accident so common. When rabies is actually present among the canine race, I should feel myself called upon to make a thorough application of the nitrate of silver to the wound, as recommended by Mr. Youatt, who considered this remedy as almost infallible, if applied immediately; and who, from his liability to be bitten, always carried a piece of caustic in his pocket, and had many times made use of it with effect on his own person; or, if circumstances required, free excision should be made of the injured part.

The following remarks of Mr. Youatt are of so much value, that I have extracted them at some length:—

“The wound should be thoroughly washed and cleansed as soon as possible after the bite is inflicted; no sucking of the parts, as is advised by many, for the purpose of extracting the poison, as the presence of a small abrasion of the lips or interior of the mouth would, most assuredly, subject the parts to inoculation. If the wound be ragged, the edges may be taken off with a pair of sharp scissors: the wound must then be thoroughly cauterized with nitrate of silver (lunar caustic), being sure to introduce the caustic into the very depths of the

wound, so that it will reach every particle of poison that may have insinuated itself into the flesh. If the wound is too small to admit of the stick of caustic, it may be enlarged by the knife; taking care, however, not to carry the poison into the fresh cut, which can be avoided by wiping the knife at each incision. Should the wound be made on any of the limbs, a bandage may be placed around it during the application of these remedies, the more effectually to prevent the absorption of the veins. Nitrate of silver is a most powerful neutralizer of specific poisons, and the affected parts will soon come away with the slough; no dressings being necessary, except perhaps olive oil, if there should be much inflammation of the parts. If the above plan be pursued, the patient need be under no apprehension as to the result, but make his mind perfectly easy on the point."

A question has been frequently asked, whether these symptoms might not be of a tetanic character, from the irritation of the wound. There has not been the slightest appearance of trismus, or locked-jaw, in any of the cases I have seen; and the lapse of time from the receipt of the wound has been too long to be attributed to such a cause, the wounds having healed, and, for the most part, having shown little signs of irritation.

When writing this, I had a case of trismus, or locked-jaw, at the Hospital, which, although not severe, afforded an opportunity of comparing this rare disease with hydrophobia. The patient was a woman, 45 years of age, in quite good health, upon whom a large plank fell, producing a compound fracture, and dislocation of the ankle-joint. I saw her about half an hour after the receipt of the injury: the lower extremity of the tibia projected through a large wound at the ankle-joint, the internal malleolus being broken off, and left in the wound. This I removed with a knife, so as to allow the dislocated bone to be restored to its proper place, with the hope, in the first view of the case, of saving the limb. On further examination, however, when the restoration of the bone allowed of a more full investigation of the joint, I found the injury of the tibia to be complicated with a comminuted fracture of the fibula, some pieces of which lay loose in the joint. Another fracture of the fibula also existed, about half-way up the limb. Amputation

of the leg was, therefore, resorted to by the double flap, just above the upper fracture, in what appeared to be sound parts.

Although every thing seemed to be favorable for union by the first intention, yet the wound partially suppurated, and took on a sloughy appearance; the vital powers of the tissues having probably been injured by the blow, although this, at the time, was not apparent. The patient, however, complained of little or no pain, but seemed to be quite comfortable and in good spirits, though with little appetite: she had no fever, and no other symptoms of constitutional irritation.

On June 30th, when I visited her in the morning, she told me that her jaws were stiff, and she could only open them about a quarter of an inch, by taking hold of them with her hands. She said that she had felt some soreness in her jaws for about four days, but had not thought it of sufficient importance to mention. I suspected the nature of the disease, and requested Dr. Stearns to keep a close watch upon her, and inform me if any thing unusual occurred: I also encouraged her to take a more stimulating diet. She herself was not advised of our suspicions.

In the afternoon, she was suddenly taken with slight tetanic spasms, great difficulty of breathing, and coldness of the extremities: stimulants were administered, hot applications and other external remedies used; and, when I saw her about 6, P.M., she was in a very comfortable condition. Her jaws, at this time, had to be pried open to introduce any thing. I ordered a drachm of the solution of the sulphate of morphia to be administered every three or four hours, and as much brandy to be given as she was disposed to take.

She passed a very quiet night under the treatment directed, and, on the following day, pronounced herself much relieved: the stump was suppurating freely, and gave her no pain.

The mental condition of this patient and of the one with hydrophobia, it will be perceived, were strikingly different. The former was perfectly calm and collected, the pulse not much affected, being rather below than above the natural standard: the latter semi-delirious, agitated, and violent; the pulse very rapid. To a person who has seen the two diseases, a mistake in the diagnosis is not easy.

EXTRACTION OF NEEDLES.

The extraction of needles which have penetrated different parts of the body is not an unimportant part of surgery. As a rule, it is better never to attempt an operation unless the needle can be distinctly felt. Even then, after the first incisions, if it is not immediately exposed, the traces of it are apt to be lost, and the search tedious. Where the operation fails to disclose it, by the application of a poultice bringing the wound into a suppurating state, the discolored needle, in the course of a few days, often makes its appearance; and I do not remember, in my own practice, any instance of injury to the patient from delay under the above circumstances, whereas great harm may be done by an unavailing search among delicate and sensitive textures; for instance, the palm of the hand, the sole of the foot. I propose to give a few cases of the results of needles penetrating the knee-joint, a number of which have come under my observation; these being, on the whole, the most embarrassing of any of this class of cases that we have to deal with, and the knee-joint being more exposed than any of the joints to this kind of injury. It will be observed, that, in three out of the four cases given below, the needle broke off in the joint, after having been fixed in the bone.

CASE CCCLVI. — *Needle penetrating the Knee-joint. Remained fixed between Condyles.* — Feb. 13, 1854, a child of scrofulous habit, five or six years old, while kneeling on the floor, had a needle larger than the ordinary darning-needle penetrate, and break off in the knee-joint. Being called to see this child, in consultation, I found that a small aperture could be distinguished below and to the inside of the patella. The leg was flexed on the thigh, and fixed in that position so that it could not be extended. The needle seemed to have penetrated between the condyles of the femur, to have become fixed there, and to be broken off in the joint, as nothing could be felt of it externally. I advised that a dissection should be made as far as the capsule, but to abstain from going further unless the needle could then be detected.

This was done, but nothing found. The question then arose, whether the limb should be left in the position in which it was fixed. I advised strong flexion and extension to be made, so that, in case the body were lodged in the way supposed, it might either be dislodged, or else plough up for itself a cavity in the cartilage of the head of the tibia. By these measures, the motions of the limb were restored. The child was kept perfectly quiet for a few weeks, until all inflammatory symptoms had subsided; after which, he walked about without inconvenience.

This patient died of phthisis some years after the accident; and, on examination of the knee-joint, the following was the appearance: The needle, as had been supposed, was firmly lodged between the condyles of the femur. It was somewhat corroded; and, from the motions of the joint, it had worn and maintained for itself a passage, so as not to interfere with flexion or extension. The joint itself was otherwise healthy.

CASE CCCLVII.—*Needle penetrating Knee-joint. Fungous Growth from Wound. Recovery.*—A child six years old ran a needle into the knee-joint, in the summer of 1853. It was immediately withdrawn; and the child, not suffering any pain, was allowed to use the limb. A few days after, severe inflammation came on in the wound, and a fungus shot out. At this period, I was called to see the patient. The joint was found to be in a very tender and inflamed condition. On flexion, a quantity of pus ran from the wound, which was surrounded by a fungus of the size of a five-cent piece. Entire rest, with a splint, was enjoined, and the fungus was touched with caustic; causing at each application an increase of inflammatory trouble. After four or five weeks of treatment, the case finally terminated favorably. The needle had entered just on the inner side of the ligament of the patella.

CASE CCCLVIII.—*Needle broken off in Joint. Fixed in Bone. Removal by Operation.*—This instance was observed in a child of five years. Kneeling down on the floor in front of a bureau, to get something from underneath it, a needle,

which had been engaged in the carpet, ran into the joint, and broke off. When seen by me with her physician, Dr. Ball, her limb was painful on motion, somewhat swollen, and she was unable to walk. By making strong flexion, a hard substance could be felt below the patella, on the inside of the joint, giving to the touch the sensation of some large body like a nail.

The patient being etherized, a dissection was made through the skin and fat, until what appeared to be the capsule of the joint was reached. Within this, the foreign substance was felt, firmly embedded. The nails of the two forefingers were pressed against it on each side, causing it to project through the capsule, when it was seized by the forceps. It was now found quite difficult to extract; and this was only done after a number of efforts, and by working it laterally, thus disengaging it from the bone. A splint was directed, with applications of cold water, and care in diet; her physician promising to give information if any symptoms requiring attention should present themselves.

The patient did well.

CASE CCCLIX. — *Needle broken off in Knee-joint and fixed in Bone. Extraction.* In January, 1867, I was called in the evening to see a young lady, 15 years of age, who, three hours before, while kneeling on the carpet with a child in her arms, felt something penetrate her knee. She immediately examined, and withdrew through her clothes two-thirds of a common-sized needle. She was able to walk up stairs, though somewhat lame. When I saw her, with her physician, we detected a small puncture, surrounded by an ecchymosis below and on the inner side of the patella. On a careful examination with the finger, a hard substance could be detected like the portion of a needle, which varied its position according to the motions of the joint. It could not, however, be made prominent. The probability was, that it had penetrated the bone, and had broken off inside the joint. I determined to cut down as far as the capsule, and explore. This was done by a very careful dissection, occasional pauses being made to allow the bleeding to cease. The capsule, covered by a slight cellular layer,

being arrived at, the substance, which could easily be felt with the limb extended before the incision, now almost completely disappeared. The limb was then forcibly bent, when the needle at once was felt pressing against the capsule, and apparently fixed in the under part of the patella. The wound being held widely open, and every thing kept steady, with the handle of the knife on one side, and the nail of the thumb on the other, the needle was made to project through the capsule, and could be seen through the areolar tissue over it. A touch or two of the knife now exposed it; and, being seized with the forceps, with a little force it was disengaged from the bone. It was about half an inch long, and had already become blackened.

The wound was at once closed by a suture and adhesive plaster, and the limb confined in a straight position, in a splint, with an injunction not to flex it for a week. I saw her on the following day; and she was quite free from any pain, swelling, or sensibility of the joint, and has since done well.

INJURIES OF THE OS COCCYGIS.

I have met with quite a number of instances of this kind, where the lower part of the os coccygis has been injured; all of them occurring to females from slipping while descending the staircase, or stepping suddenly out of doors on a step covered with ice, and receiving various concussions in sliding from one stair to another. The severe and long-continued symptoms arising from this injury are not easily explained. Scarcely an instance can be said to have resulted in perfect recovery; and many of them have caused severe local symptoms for some months and even years afterwards. The symptoms do not seem to be easily explained, either by supposing them to be caused by a concussion of the spinal marrow, or by a local lesion of the nerves of this part: although the region is very fully supplied by nervous filaments. They seem to resemble more closely those acute pains which attend periosteal inflammation. The effect of this injury I propose to illustrate by a number of cases.

CASE CCCLX. — *Injury of the Coccyx.* — A lady slipped as she was coming down stairs, and struck violently on the coccyx. She descended two or three stairs, striking on each of them as she fell. The pain in the part, after the injury, was of the most severe character: the whole system seemed to sympathize with it, and there was considerable numbness in the upper and lower extremities.

The constitutional symptoms very gradually subsided; but the pain and inability to sit upon the part lasted more than a year, and the sensitiveness of it continued for ten years after the accident. At the time, on examination, no fracture could be detected; but, on account of the sensitiveness to the slightest touch, the investigation was necessarily superficial.

CASE CCCLXI. — *Injury of the Coccyx.* — A lady who, for some years, had been in delicate health, slipped as she was descending the stairs, and went from the top to the bottom, striking successively the lower part of the back on each stair. She was taken up in an almost insensible condition. As the first shock of the accident subsided, the most violent sympathetic nervous symptoms supervened, attended with severe pain in the coccyx. The head was in a state of great congestion and confusion, the hearing and eyesight exquisitely sensitive, the arms and legs spasmodically contracted.

Being out of town, this lady was attended by one or two distinguished physicians, who came to her from a distance. The coccyx being examined, a distinct displacement of the bones was distinguished, and by proper manipulations adjusted. In this condition she remained two or three months, unable to be removed to the city, and requiring constant application of remedies to relieve pain and sustain life. She was finally brought to Boston, and came under my care.

When she first arrived, I made an examination, and discovered a distinct swelling between the first and second bones of the coccyx, feeling as if ossific matter had been thrown out there. At the end of four months, these appearances had subsided. During the interval, the patient had been confined to a bed or sofa, and, notwithstanding every contrivance that ingenuity could

suggest, was unable to bear any pressure upon the injured part. Air-cushions, with apertures in them, had been tried, but without effect; the mere tightening of the skin around producing suffering not to be supported. The patient was now able to walk about the room a little with support, and after a time was taken down stairs in the arms of attendants, put into the carriage, and driven out, supported in the horizontal position. She did not recover from the immediate effects of the accident for one or two years, and now, at the end of eight years, is not able to ascend stairs without suffering.

CASE CCCLXII. — *Injury of the Coccyx.* — An unmarried female, 30 years of age, was brought into the Massachusetts General Hospital in the spring of 1858, having fallen while going down the cellar-stairs, striking violently on the coccyx, and injuring one of the ribs. She complained very little of the latter injury, although one of them seemed to be fractured, but made the most violent exclamations in regard to the suffering in the lower part of the sacrum. There was an inability to move the lower extremities, but no want of sensibility in them. No fracture or displacement of the coccygeal bones could be detected. Leeches, fomentations, the internal administration of opium, were resorted to. The only relief, however, which she obtained, was from the local application of laudanum, or poultices sprinkled over with ten grains of opium. It was two or three weeks before she began to obtain decided relief, and about six before she was able to leave the Hospital.

CASE CCCLXIII. — *Fracture of the Coccyx.* — While making a visit at the Hospital with Dr. Cabot, in February, 1859, he pointed out to me a patient he had just successfully treated for vesico-vaginal fistula. I observed that she sat leaning forward in a very awkward position. Dr. Cabot said that the position was not owing to her present difficulty, but to an injury she had received some years before in going down the cellar-stairs, when she slipped upon something left in the way. The consequence was a fall, in which she struck on the lower part of the back. The coccyx was fractured and

displaced, and remained so, as was verified by an examination made by himself. At the time, she was confined about five weeks, with very severe symptoms, and had never ceased to suffer in the part up to that time.

CASE CCCLXIV. — *Repeated Injuries of the Coccyx.* — In March, 1859, I was called to a married lady who had fallen the day before on the ice, striking her back. Part of the blow was received upon the coccyx. The injury produced considerable lameness, and, for some days, almost inability to bend the back or make any lateral motions.

This patient twice before had a similar injury: once, when a child, from the effect of which she never recovered; and the second time about fifteen years after, when she was under my care for the same injury, at which time she was confined to her bed for a number of days, requiring the persistent application of narcotics.

CASE CCCLXV. — *Injury of the Os Coccygis.* — May, 1859, a young lady, 19 years of age, was brought to me with an injury of the coccyx. Three years before, while sliding on the ice, she fell, and received a severe blow on the lower part of the spinal column. The pain and tenderness confined her for two or three days, and she was unable afterwards to bear the least pressure on the part, while there was a constant sense of uneasiness in it.

About a year before, a swelling commenced there, and slowly increased till it became of the size of a walnut, but with no inflammatory appearances about it. This was punctured in April, 1859, by her physician; and, as he stated, a curdy matter discharged from it. After that, a serous fluid continued to flow; the opening remaining fistulous, with an inflamed elevation of nearly half an inch above the surrounding tissues. The discharge caused considerable irritation between the nates and in the vicinity.

Having examined the disease with a probe, and not discovering any carious bone, I advised that the patient should be etherized on the following day, and the tumor freely incised. This

being done, and the cavity fully exposed by a free incision, a finger was introduced, and the end of the coccyx felt, but not denuded. The interior of the cavity, being now exposed to the light, presented that white, silvery, epithelial aspect observed in the sacs of some encysted tumors. The whole of this sac was carefully dissected out, and the cavity stuffed with scraped lint.

On the second day after the operation, a poultice was applied, which freed the wound from the adherent lint. The wound was afterwards dressed simply, and the patient allowed to get up and move about. She recovered entirely.

Dr. Simpson, of Edinburgh, has described this affection in his usual clear manner; and, in some obstinate cases, after having tried all remedies in vain, proposed, and practised with success, the girdling of the coccyx by subcutaneous section, just above the diseased part, so as to cut off all nervous communication with it.

FRACTURE OF BASE OF SKULL.

CASE CCCLXVI. — *Fracture of the Base of the Skull. Recovery.* — A man was brought into the Hospital, June 2, 1866, in an apparently dying state, who, two days before, had fallen from an attic window, out of which he was leaning on account, as he afterwards said, of an asthmatic affection. He lost his balance, and fell twenty or thirty feet, striking on his head. When I saw him, he was lying on his back in a partially comatose state, and, when roused, answered reluctantly by signs. His right eye was ecchymosed, pupil fully dilated, and not at all stimulated by the light. He had had a bloody discharge from both ears; the marks of it on the right side still remaining. His pulse was 120, soft, regular, and moderately full.

An examination of the cranium being made, no fracture could be detected. There was very great tenderness at the upper part of the spine, where it joined the head. Contusions were found over various parts of the body.

The patient remained in a very low condition for about four-

teen days, and with all the symptoms of fracture of the base of the skull. He was then attacked with a severe diarrhœa, which none of the remedies used seemed to have any effect upon, and while it reduced his strength, seemed to improve his intelligence. Under it, in the course of ten days, the cerebral symptoms disappeared; and he began to recover the sensibility of the right eye so as to distinguish light from darkness, and at times could see large objects before him. After arriving at the very lowest state of muscular debility, he began to revive, and was finally sent to one of the public institutions; the symptoms caused by his original injury being in a great measure relieved after about four weeks of treatment.

This case is related as one in which, from the way the injury occurred, and the subsequent symptoms, death was thought to be inevitable by all the surgeons who saw him. The cerebral symptoms were apparently relieved by the supervention of diarrhœa.

CASE CCCLXVII. — *Resuscitation of a Young Lady after Long Submersion.* — There has been considerable difference of opinion expressed as to the length of time required for death to take place by drowning. Two or three minutes' submersion is generally considered sufficient to destroy life. Cases, however, have been adduced, of persons who have been six, fifteen, or even thirty minutes under water, and yet have been restored. The following case occurred at the dreadful accident at Norwalk, Conn., where, from the train of cars running off the bridge into the channel of the river, from forty to fifty persons lost their lives. In this case, nearly twenty minutes elapsed before attempts at resuscitation were commenced: and, at the very lowest computation, ten minutes must have passed before the patient was taken from the water; i.e., time enough for a boat to put out into the middle of the stream, an aperture to be cut with an axe in the side of the car, her mother to be removed, who had her head above water, and still kept hold of the young lady, who was fixed in the seats beneath the water. After being taken from the car, she was transported to the shore in a boat, and thence an eighth of a mile to the shed where I first saw her.

At this time, all the physical appearances of death were present. The body was cold, the mouth and nose covered with froth, the face swollen and livid, the pulse could not be felt, and respiration had entirely ceased. After clearing away the froth from the mouth and nostrils, I had the body inverted, so as to drain the water as much as possible from the air-passages. The motions of respiration were then imitated by raising and depressing the ribs. At the same time, the finger was passed down the throat, and the epiglottis lifted, to enable the air to enter the cavity of the chest. By following up this process, aided by frictions over the whole body, I finally discovered some action in the muscles of the throat; and, on perseverance, a slight gasp at length showed that life was not extinct. Respiration and restoration of the pulse were not established till after long persistence in the process described. Meanwhile, by sending to the village, a blanket was obtained, in which she was wrapped, and her wet clothes removed. Having procured some brandy, her mouth was stimulated with it; and subsequently a little was poured down the throat, when I thought the power of swallowing was restored. Constant and long-continued action was required, before the circulation and respiration were regularly performed. In about two hours, or as soon as I thought it safe, she was wrapped up, and conveyed to the house of the hospitable people in the vicinity, who did so much on that day to succor the wounded. She shortly after became delirious, in which condition she remained for a part of the day. For a week she was seriously ill; but I saw her about a month afterwards completely recovered, and entirely unconscious of the events which had transpired during that dreadful day.

Out of fifty persons drowned, she was the only one recovered. The shed in which I was, was filled with bodies taken from the water; and, as they were brought in, I instructed and encouraged the bystanders to go through the same manœuvres that I was practising in the present case. Partly from want of persistence in them, but more probably from the attempts coming too late, nothing was effected. There were many distinguished physicians in the train, some of whom were destroyed either by drowning, or from concussion received by the falling

cars ; and those who escaped were engaged in the town of Norwalk, at a distance, doing efficient work among the wounded, — setting fractured bones, sewing up wounds, and giving other assistance.

CASE CCCLXVIII. — *Induration of the Cellular Tissue.* — This disease is a very common one in the French hospitals, and a very fatal one ; more than two-thirds of those who are attacked with it dying. By examinations after death, yellowish or greenish sero-albuminous fluid is found effused into the cellular membrane. The remote cause is uncertain. It has been frequently attributed to the imperfect filling of the lungs with air at birth.

In this country and in England the affection is a very rare one, and I have seen but few cases of it. My friend, Professor D. H. Storer, — whose experience on the subject is second to that of no one in New England, and whose valuable advice, I take this opportunity of saying, I have availed myself of in many cases related in this work, — informs me that he has very seldom met with it in his practice. The following is an instance : —

In February, 1847, I was requested to see a child six weeks old, and received the following history of it : When a week old, it was accidentally discovered that the cellular membrane of the thighs and legs was as hard as marble, and that this had gradually extended up on the body ; the part at which the hardness terminated being so perfectly distinct that it could be marked by a line drawn around the body. I directed frictions to be made over the indurated part with warm sweet oil ; and, in the event of this failing, the use, to a limited extent, and with proper precautions, of mercurial ointment.

Under this treatment, the hardness began gradually to be dispelled ; and, at the end of six weeks, it had quite disappeared from every part, with the exception of a few lumps in the popliteal space.

CASE CCCLXIX. — *Ivory Penholder, four inches long, removed from Bladder.* — In February, 1844, I was requested

by a physician to see a boy 14 years old, who, two days before, while engaged in passing an ivory pen-handle into his urethra, had it slip from his grasp, and carried back into the bladder. After the accident, his water dribbled away from him, and was occasionally tinged with blood.

Wishing to conceal the fact of its introduction, he had made an incision into the perinæum with a penknife, for the purpose of extracting it, thinking he felt it at that point.

On examination by the rectum, the foreign body could be distinguished lying across the bladder, one end of it just engaged in the neck of that organ, from which it had been prevented from entering entirely by the irritation caused by it producing a contraction of the cavity to half its natural size.

Cooper's forceps, for extracting small calculi, were now introduced into the urethra; and, on reaching the foreign body, opened and manipulated, with the expectation of engaging it in its grasp. After some ineffectual manœuvres, this was finally effected; and the penholder, whose farther extremity was lifted up in the bladder, was seized at an obtuse angle. By a little traction, and aided by the finger in the rectum, it made a spring-like motion on the forceps, and came into a straight line with it, and was thus withdrawn.

All the symptoms were at once relieved.

Dr. Paul F. Eve, in his collection of "Remarkable Cases in Surgery," has given a number of instances in which foreign bodies have been removed from the bladder in this way.

WRY NECK.

CASE CCCLXX. — *Division of the Sterno-mastoid Muscle for Wry Neck.* — I was requested, in 1841, to see a boy 16 years old, affected with wry neck, and received the following history of his case: —

When four years of age, he fell from the top of a staircase to the bottom. No wound was to be discovered on any part of the body: he complained, however, of a pain in the left side of the neck. Shortly after the accident, it was found that the head inclined to the left, and that the muscles of that side were

in an unnatural state of tension. This distortion gradually increased, until it attained the appearance which it presented at the time I saw him, twelve years after the accident. At this period, he was suffering from frequent attacks of headache, and from an almost constant and severe pain in the left side of the neck. He was rather short for his age, and the distortion aided much to diminish his natural height.

On viewing him in front, the following were the appearances observed: 1st, The head was drawn down to the left side, the ear usually resting on the left shoulder, although he had the power of raising it a little from that position; 2d, This inclination was accompanied by a rotation of the head, so that the face regarded the right shoulder.

Observed from behind, there was a deep sulcus on the left side of the neck, with a corresponding projection on the right side, made by the transverse processes of the cervical vertebræ. A curve had taken place both in the cervical and in the lumbar portions of the spinal column. The left shoulder was higher than the right. The left side of the chest was projected, and there was a considerable depression of the ribs on the opposite side. On examination of the vertebræ, proceeding upward, the spinous processes of the cervical portion could be distinguished until the third vertebra was arrived at: here the line of the column was lost, being concealed under a large mass of muscle; with great care, the spinous process of the second cervical vertebra was discovered, having performed a rotation of nearly the quarter of a circle on its axis. The sterno-mastoid muscle of the left side, on being examined, was found to be very strongly retracted, as well as the deep-seated muscles of the neck; the scaleni particularly could be made out in an unnatural state of rigidity. The former, however, appeared to be the chief obstacle to the endeavors for bringing the head to an upright position.

In addition to these changes, the face had undergone a remarkable alteration, worthy of notice. The whole left side of the face was more or less atrophied, and each of its component parts was much smaller than those of the other side: the left eye was much smaller than the right, which was raised up, and

on a level higher than its fellow; and this appearance was not owing to the inclined position of the head alone, as was more distinctly verified when the face was brought into its natural position after the operation.

The health of the patient was not good; and in addition to the mortification of being afflicted with so severe a deformity, the pain at the spot where the curvature was most extreme was at times excessively severe. He slept usually on his right side, sometimes on his back, but never by any chance on the left side.

It having been ascertained, so far as was practicable, that the chief obstacle to the restoration of the head existed in the unnatural state of the sterno-mastoid muscle, it was determined to divide it at its sternal insertion; the retraction, according to Guérin, who is considered the best authority on this point of surgery, generally existing in this portion of the muscle.

The operation was performed as follows: The head being supported, and carried a little forward, so as to project the muscle outward from the subjacent parts, the patient was directed to make strong efforts to exaggerate the existing rotation, so as to produce as great a tension of the muscle as possible. A puncture was now made with a lancet through the skin, about six lines above the clavicle, between the sternal and clavicular portions of the muscle. The narrow, blunt-headed knife of Bouvier was next introduced, its flat side towards the muscular fibre, carried behind the sternal head, its edge towards the muscle, and the section completed by a slight sawing motion. The effects of this operation were at once manifested by a distinct crackling sound, by a separation of the divided parts, and by the partial restoration of the head to its natural position, also by the possibility of rotation in every direction. The wound on the neck was covered with a piece of court-plaster, a cap placed on the head, to the back of which, opposite the right mastoid process, a strap was attached, and, being drawn tight, was secured over the breast of the same side.

On the following day, he was quite comfortable: he had slept well, lying on his left side, which he had been unable to do

before the operation; the pain in his neck had entirely left him. The plaster covering the wound was removed at the end of forty-eight hours, entire cicatrization having taken place. The patient was then directed to wear a stock on the neck, and to make strong and constant efforts to rotate the head: he was also placed on an inclined plane for three or four hours daily, the head secured by a bandage carried under the chin and attached to the upper part of the board.

In the course of a fortnight, a very great improvement was perceptible: the head, however, had not yet regained its proper position, but was still inclined to the left. The divided muscle had united; a firm and almost cartilaginous substance being apparent at the point of union. The clavicular portion of the muscle had become much more prominent since the division of its sternal attachment, and felt round and corded, presenting an obvious obstacle to the adjustment of the head. It was therefore thought advisable that the division of this part of the muscle should be effected; and, in order to derive the full advantage from it, the operation was performed in the following manner:—

The head being supported and the muscle sufficiently relaxed, the body of the sterno-mastoid, just above its division into sternal and clavicular heads, could be readily seized between the thumb and forefinger, and completely isolated from the deep-seated parts. An appropriate knife was now carried behind the muscle, until it could be felt by the finger under the skin on the opposite side; and, the patient being directed to place the muscle in strong contraction, the section was completed without difficulty.

The second operation was not followed by any inflammation, the wound being quite healed at the end of forty-eight hours; and, by persisting in the treatment before directed, the head was very shortly restored to its normal position. Nine months after the operation, I made the following observations of his appearance:—

To a person regarding him in front, a slight cant of the head is observable to the *right* side, evidently owing to the constant and determined efforts of the patient to overcome his deformity

by carrying the head in an opposite direction. The face still presents the alteration already pointed out; viz., an atrophy of the whole of the affected side. The eye of the left side is much less prominent, the lid more closed, and the level of it lower than its fellow: the whole osseous, cellular, and muscular system partake in this alteration, or want of development.

From behind, the following changes are visible: The dorsal and lumbar curvatures of the spinal column have disappeared, and the shoulders have regained their natural elevation. The depression of the ribs on one side, and the projection on the other, are fast disappearing. The right half of the muscles of the neck still remain greatly developed above that of the other side, and a slight curve still exists in the cervical vertebræ. The health of the patient has greatly improved; and his appearance is so completely altered since the operation, that his former friends scarcely recognize him.

CASE CCCLXXI. — *Division of the Sterno-mastoid Muscle for Wry Neck.* — The following case was operated upon by Dr. John C. Warren, in the first part of June, 1841: —

The patient was a little girl, nine years of age. When about four weeks old, the parents observed that the muscles on the left side of the neck were in an extraordinary state of tension: it was not, however, until the age of four years, that the head began to be distorted; and from that period the distortion has gradually increased, so that the contraction became so great as to bring the mastoid process nearly in contact with the left shoulder, accompanied by a strong rotation of the head to the right. This distortion evidently had a great effect on the health of the child, who was pale, emaciated, and of a feeble constitution. A double lateral curvature of the spine existed, though not so marked as in the preceding case.

Under these circumstances, Dr. Warren determined to divide the sterno-cleido-mastoid muscle of the left side, which was found to be strongly retracted, and was evidently the chief obstacle to the return of the head to the upright position.

The operation was performed in the following manner: The head being supported so as to give sufficient projection and ten-

sion to the diseased muscle, a narrow, sharp-pointed bistoury was passed between the skin and its sternal attachment, from without inward: the edge of the knife was now directed upon the muscle, and the division accomplished. The knife was again entered at the same orifice, carried in front of the cleidomastoid, and this head of the muscle divided in a similar manner.

The result of the operation was an immediate alteration in the head to a more upright position. The wound healed in three days. The subsequent treatment was the same as that detailed in the preceding case.

The following is the substance of a letter received from her father two months after the operation: He stated that she had perfect command of her head, and a power of rotation in all directions. Her head was so nearly straight that a stranger would not notice any deformity. "From the shoulders, her neck slopes to the right, which is apparent when standing behind her. The short curve at the upper part of the neck can scarcely be perceived. The cavity on the one side, and the enlargement on the other, have returned to almost the perfect shape. Her schoolmates are astonished when they see her with her head up, and say how tall she has grown. Her neck, you will probably remember, was apparently very short: it is now a very long neck for a child of her age. She occupies the inclined plane four hours each day."

Remarks. — In reviewing these cases, we shall find the following circumstances worthy of notice: In the first place, the anatomical changes produced by the contraction of the muscle are very interesting, as bearing on many cases of deformity besides that now under consideration. The left half of the face, as has been already stated, had become more or less atrophied during the continuance of the disease; so that the whole osseous system, as well as the soft parts, was implicated in the diseased action. The alteration has been attributed by M. Guérin to the distortion which the great vessels of the neck undergo before their entrance into the cranium. The curvature to the right, which the cervical vertebræ make on the dorsal, produces a strong traction of the skin, by which an oblique position is

communicated to the left part of the face. The eyeball also undergoes a rotation on its axis, so as to bring it into the horizontal direction; the eyes, as M. Guérin remarks, being placed in relation to each other, as it were, on a staircase, from whence considerable trouble in vision is produced on the first adjustment of the head. The alteration in the spinal column is also interesting. In order to obviate the inclination of the head to the left, which brings it without the axis of the body, an inclination takes place of the cervical on the dorsal region, of the dorsal on the lumbar, and of the lumbar on the sacral. The depression of the ribs on the one side, and their projection on the other, naturally follow from the persistence of the curvature in the spinal column.

There are few operations that have been more benefited by the establishment of the principle of subcutaneous incisions than that for wry neck. The operation previously employed by distinguished surgeons consisted in first making a transverse incision through the skin, so as to expose the fibre of the sternomastoid: the muscle was then carefully dissected, layer by layer, until the whole was divided. The results of this method were often very severe: there was great inflammation, and supuration, frequently followed by infiltration of pus into the anterior mediastinum, sometimes causing the death of the patient. The contraction, also, of the cicatrix from so severe a wound, often counteracted the benefit derived from the division of the muscle.

To M. Guérin, of Paris, we are chiefly indebted for the exposition of the pathology, physiology, and the surgical treatment of wry neck. M. Guérin has endeavored to establish the following propositions:—

1st, That what has been called the sterno-cleido-mastoid muscle constitutes, in fact, two distinct muscles, — the sternomastoid and the cleido-mastoid.

2d, The sterno-mastoid and the cleido-mastoid are possessed of different functions: the first is a flexor and rotator of the head, the other muscle is essentially a muscle of respiration.

3d, In wry neck, which has thus far been attributed to the shortening of the sterno-mastoid, the sternal muscle is primitively alone affected.

4th, That, in the treatment of chronic wry neck, owing to the shortening of the sterno-mastoid, the section of the sternal portion alone suffices to destroy the essential cause of the deformity.

The practical inference to be drawn from them appears in the fourth proposition ; viz., that in the majority of cases, the sterno-mastoid is primarily affected, and this alone requires an operation. Where the affection has lasted for a length of time, as in the two cases stated above, the cleido-mastoid almost always partakes in the diseased action ; and although, by a long persistence in the use of mechanical means, this may be sometimes overcome, yet the cure is undoubtedly much facilitated by its division. M. Guérin has drawn a distinction, worthy of notice, between what he calls the *retraction* and the *contraction* of the muscle. The former, he has endeavored to show, only takes place after a long persistence of disease, and consists in a fibrous degeneration of the muscle, and always requires surgical interference ; whereas the latter, which occurs in acute wry neck, is a simple temporary shortening of the muscular fibres, such as occurs in common muscular action, and is always amenable to the use of local remedies, more particularly the application of the tartar-emetic ointment.

The following is the most approved manner of performing the operation : The head of the patient, being firmly supported, is carried a little forward and strongly rotated, so as to project the muscle outward from the subjacent parts, and make it as tense as possible. A fold of skin over the muscle being raised, a puncture is made with a lancet from four to six lines above the clavicle, and between the insertions of the two heads of the muscle. The narrow, blunt-headed knife of Bouvier is now introduced, and carried with its flat side between the muscle and the skin. The hold on the skin may now be relaxed, the edge of the knife applied to the muscle, and the division effected. This is usually announced by a crackling sound, and by the partial adjustment of the head. Instead of passing the knife in front of the muscle, it may be carried behind it ; but in this case it is well that the knife should have a different shape : in the former a concave, and in the latter a convex, edge is re-

quired. If it should now be determined to divide the clavicular head of the muscle, the knife may be introduced into the same orifice in the skin, carried backward, and the division made as in the preceding case; the section of the muscle from without inward being here always to be preferred, as more safe and easy of execution.

When the projection of the muscle from the parts beneath is sufficient to remove them from the danger of being punctured, and it has been determined to divide the body of the muscle, the method may be adopted which was practised in the former of the two cases which have been related. The body of the muscle just before its division being seized between the fingers, so that these are made to meet behind it and ascertain that no obstacle intervenes, a narrow-bladed knife is carried beneath, until the point is detected under the skin on the opposite side; and the division is then to be made from within outward.

In dividing the internal head of the muscle, we have occasionally beneath the skin the anterior jugular vein, as it passes across the neck to enter the subclavian. This, however, is easily avoided by making the incision sufficiently near the clavicle. The carotid and internal jugular are protected by the sterno-hyoid and sterno-thyroid muscles, and could not be reached but by the point of the knife carelessly introduced. In dividing the cleido-mastoid, the external jugular, which lies between the border of the muscle and the skin, may be wounded: this is avoided by raising the skin and passing the knife with its cutting edge perpendicularly to the muscle; the vein being left between the back of the instrument and the skin. In dividing the body of the muscle, the external jugular is the principal vessel to be avoided, and with sufficient care can be easily left on the outside of the puncture necessary for introducing the knife employed in the operation.

CONGENITAL FUSION OF FINGERS.

CASE CCCLXXII. — *Congenital Fusion of the Middle Fingers of both Hands. Operation. Cure.* — I am led to record the following case, from the difficulty experienced, when

it was first brought to my notice, of procuring any practical information on the subject from the surgical works generally referred to as authority. I was requested, in October, 1857, to see a child, who had been born a few days before, with an intimate union of the middle and ring fingers of each hand. The child was a very fine one, and otherwise perfect; its parents, remarkably handsome and well-formed. They were extremely anxious that some operation should be done to bring the fingers into a natural condition. On a careful inspection, I found the state of things as follows:—

The conjoined finger of each hand had but a single nail, somewhat elongated on one hand, and showing a slight disposition to break up into two. No fissure or depression could be distinguished marking the distinction between the two fingers, as may be observed in what is called webbed fingers. The finger was susceptible of flexion and extension; but no appearance of separate joints could be observed, or separate bony structure: in fact, there was apparently but one finger in place of two. I therefore advised that the operation should be delayed, to afford sufficient time for the development of the different organs; that the conjoined fingers should be seized, and made to work laterally one upon the other, so as to elongate, if possible, the uniting medium between the two.

The preceding plan was adopted; and, at the end of six months, the bony structure, joints, and other textures, were sufficiently developed to show the elements of two fingers in the mass, and warrant the attempt at an operation with a reasonable chance of separating them, without cutting into the joints, and producing stiffness or ankylosis. The operation was thus performed:—

The child being etherized, the ends of the fingers, where the bony structure seemed to be united, were separated up to the first joint, by the cutting pliers. A careful dissection then separated the fingers, fortunately without entering the joints, except possibly the last joint of one finger on one hand, which might have been opened; but this was doubtful, and not at all indicated by the subsequent progress of the case. The dissection was carried rather farther towards the hand than the natural division, in

fact nearly down to the first or knuckle joint, in order to allow for a certain amount of adhesion or contraction, which it was thought no art or labor would be able to prevent. It was then attempted, at the angle and sides of the finger, to bring the skin of the back and palm of the hand in contact by means of sutures. This was effected, but with great strain of the integuments, on account of the thickness of the parts. A long piece of adhesive plaster was placed between the two fingers, and made to exert as great a pressure as possible on the angle of the wound. This was replaced from time to time, the use of it being maintained throughout the whole treatment.

It will be unnecessary to go into all the minutiae of the subsequent management of the case. It proved perfectly successful, and left the child with two well-formed fingers, and the entire use of the joints. The nails, which had been divided, in the course of one or two months were covered on their cut surfaces by new skin and flesh, giving them quite a natural appearance. The cicatrix, which extended from the angle of the fingers upwards on each side, had a tendency to contract, and curve the fingers inwards; and this, rather than the disposition of the fingers to again unite, was the principal point which required attention towards the end of the treatment. It was thought useless, at the early age of the patient, to attempt any mechanical means to obviate this contraction, which was counteracted by the constant attention of the mother, in soaking, and forcibly bending them out. The result of the operation was, in place of a very great deformity, to restore the hand to a useful condition, and to an appearance which would pass without remark.

I have often operated to remove supernumerary fingers and toes from infants, and invariably with good results. Sometimes two fingers or toes are placed on the same joint, each having its peculiar facet in the joint. When the patient is very young, and the additional excrescence on the outside of the finger or toe, I have not seen any inflammation of the joint ensue from removing it. At a later period, when the joint is more fully organized, it appears best to cut off the head of the bone just short of the joint, which, if neatly done, shows

but little afterwards. I have lately operated on the following case: A little girl, eight years of age, had two terminal bones on the last joint of the thumb, with two nails; the two bones springing from one joint. By dissecting up the skin, I removed the outer one, with part of the base, without interfering with the joint; and the deformity remaining after the operation was very slight.

I have twice seen persons with a single enormous finger, appearing as if viewed through a magnifying glass. The following remarkable exuberance of growth and deformity of the foot is the only one of the kind that I have met with:—

CASE CCCLXXIII.—*Malformation of Foot*.—A woman, about 30 years of age, applied to me for an injury of her foot, which, she said, was a remarkable one, being congenitally deformed; and this I found to be the case. The foot, as far as the great toe, on the inside, was natural; and, on the outer aspect, were two natural toes. Springing from between these was what appeared to be another fleshy foot, terminated by the rudiments of toes buried in the end of it. On a careful manipulation, the osseous part of it was found to be composed of two large bones, apparently the metatarsal: there was no power of flexion in this part of the foot. On the dorsal aspect, and at the junction of this foot with the other, was what appeared to be a ganglionic swelling, which was quite tender, and had been caused by a strain. This yielded to treatment in a week or two. The length of the foot was thirteen inches.

I lately measured the foot of a man six feet six inches high, at the Hospital, and it was found to be a little less than twelve inches in length.

Mr. Anandale has recently written an interesting book on "Deformities of the Fingers and Toes," in which are cases somewhat similar to those given above.

CHAPTER XIV.

ANÆSTHETICS.

THE change made in the practice of surgery by the discovery of the anæsthetic power of ether can scarcely be appreciated by those who have come on the stage since the introduction of this agent. It was in the city of Boston, a little more than twenty years since, that the full value of this discovery was first demonstrated and published; and it is truly remarkable, that, at the present day, artificial anæsthesia is best attained by sulphuric ether, used in substantially the same manner as when it was first tried in surgical operations at the Massachusetts General Hospital. While chloroform is acknowledged to be dangerous, and while the foreign medical journals contain frequent notices of death from the use of this potent agent, it is a striking fact, that, out of the hundreds of thousands of cases of etherization, the first undoubted case of death from its action is yet to be recorded. It is not pretended by this statement to abjure the use of chloroform, which, in some cases, is certainly preferable to any known anæsthetic; being far more concentrated in form, more agreeable, and more active in administration, than any of the many substitutes which have been proposed for it. On the battle-field, especially, its greater portability is likely always to secure the preference for it over safer but more bulky anæsthetics.

The first and perhaps the most important application of ether is in producing unconsciousness of pain; and it is for this boon that the patient will ever be chiefly thankful. To the surgeon, also, the non-infliction of pain is often a matter of the greatest moment; for he can now undertake a long and tedious dissection, or a delicate exploration of an acutely inflamed cavity, undis-

turbed by the involuntary movements of the patient. The power to abolish pain has also materially enlarged the domain of operative surgery, not only by diminishing the dread of common operations, and allowing of their more frequent performance, but also by admitting into the list of justifiable operations some whose severity would otherwise, in most cases, forbid even the thought of attempting.

The other great application of ether in surgery depends upon its power of relaxing the voluntary muscles by inducing a state of the brain analogous to coma. In the deep sleep of complete etherization, the manipulation and reduction of fractures and dislocations, the diagnosis and treatment of anchyloses, the reduction of strangulated hernia, &c., are immensely facilitated. The question of its use in certain special departments of surgery will be noticed elsewhere.

This is not the place to dwell on the very important uses of ether in midwifery, and in painful or convulsive medical diseases; but of its inestimable value in the alleviation of suffering during the last moments of life, I cannot omit this passing notice.

Having been conversant with the principal facts relating to the introduction of the inhalation of ether for surgical operations from the beginning, it may not be considered inappropriate to give, in this place, a slight sketch of its early history, more especially as, since the introduction of chloroform, and its almost complete adoption abroad, the origin of etherization seems in danger of being lost sight of. The facts, so far as I am acquainted with them, are briefly as follows:—

In the autumn of 1846, Dr. W. T. G. Morton, a dentist in Boston, a person of great ingenuity, patience, and pertinacity of purpose, called on me several times to show some of his inventions. At that time, I introduced him to Dr. John C. Warren. Shortly after this, in October, I learned from Dr. Warren, that Dr. Morton had visited him, and informed him that he was in possession of, or had discovered, a means of preventing pain, which he had proved in dental operations, and wished Dr. Warren to give him an opportunity of trying it in a surgical operation. After some questions on the subject, in regard to its action, and the safety of it, Dr. Warren promised

that he would do so. On the Tuesday following, Oct. 13th, after the surgical visit at the Hospital, a patient was brought into the amphitheatre for operation. This being the first opportunity which had occurred since Dr. Warren's promise to Dr. Morton, Dr. Warren said to us: "I now remember that I have made a promise to Dr. Morton to give him an opportunity to try a new remedy for preventing pain in surgical operations," and asked the patient if he should like to have the operation done without suffering. He naturally answered in the affirmative. The operation was therefore deferred until Friday, Oct. 16th, when the ether was administered by Dr. Morton with his apparatus, and the operation performed by Dr. Warren. It consisted in the removal of a vascular tumor of the neck, which occupied five minutes. During a part of the time, the patient showed some marks of sensibility; but subsequently said that he had no pain, although he was aware that the operation was proceeding. On the following day, a woman requiring the removal of an adipose tumor from the arm was rendered insensible by ether, given by Dr. Morton; and Dr. Warren requested Dr. Hayward, who was present, to perform the operation. This was successful; the ether being continued through the whole operation, which was a short one, and the patient being entirely insensible.

A few days afterwards, Dr. Warren informed me that he had learned from Dr. Charles T. Jackson that he had suggested the use of ether to Dr. Morton.

The success of this process in the prevention of pain was now quite established. Its use, however, was suspended for a time, for reasons which Dr. Warren has already given in his first paper on ether; and the experiments were not again resumed until Nov. 7th, when Dr. Morton declared his willingness to state the nature of the agent employed. Two important operations were now done successfully at the Massachusetts General Hospital under its agency: one, an amputation of the thigh, by Dr. Hayward; the other, a very difficult and bloody operation, — removal of a portion of the upper jaw in a woman, — by Dr. Warren. On the same day, I operated on an infant for hare-lip; but, as we had thus far had little experience in the use

of ether, it was not thought prudent to employ it with so young a child. With a more full experience, however, I have since given it, in this operation, at the earliest ages of life; in one, between six and eight hours after birth.

On Nov. 12th, I performed the first successful operation under ether which was done in private practice, on a young woman, for a tumor of the arm. The ether was administered for three minutes, when the patient became unconscious. The operation then proceeded, the inhalation being continued. The patient was so entirely tranquil, that Dr. J. C. Warren, who was standing by her side, was not aware that the operation had commenced until it was nearly completed. Nov. 21st, I did another operation in private practice, at which many of the profession were present, — the removal of a formidable tumor of the thigh, which is thus described by Dr. J. C. Warren: —

“The patient lying upon a bed, the vapor was administered by Dr. Morton, in the presence of Drs. C. T. Jackson, Reynolds, J. V. C. Smith, Flagg, Gould, Shurtleff, Lawrence, Parsons, Briggs, and others. After he had breathed the vapor for three minutes, his head fell, and he ceased to respire it; but, presently awaking, the inhalation was renewed until he again appeared insensible. The operation was then commenced. At the first stroke of the knife, he clapped his hand on the wound; but I immediately seized and held it during the remainder of the operation, though not without some difficulty, in consequence of his struggles. The operation was completed in two or three minutes, and the patient remained quietly on his back, with his eyes closed. On examination, the pupils were found to be dilated; the pulse was not materially affected. After he had lain about two minutes, I roused him by the inquiry, ‘How do you do to-day?’ to which he replied, ‘Very well, I thank you.’ I then asked what he had been doing. He said he believed he had been dreaming: he dreamed that he was at home, and making some examination into his business. ‘Do you feel any pain?’ — ‘No.’ — ‘How is that tumor of yours?’ The patient raised himself in bed, looked at his thigh for a moment, and said, ‘It is gone, and I’m glad of it.’ I then inquired if he had felt any pain during the operation, to which he replied in the negative. He soon recovered his natural state, experienced no inconvenience from the inhalation, was remarkably free from pain, and in three days went home into the country.”

The preceding operations at the Hospital were followed by a variety performed there by the other surgeons of the Institution, — Drs. S. D. Townsend, S. Parkman, H. J. Bigelow, and myself.

The use of ether in surgical operations being sanctioned by the Medical Board of the Hospital, the Consulting Board, and the Board of Trustees, — the last composed, as it always is, of distinguished and prominent men of Boston, having in charge important trusts,* — was, after some little resistance, gradually adopted throughout this country, and at once made use of by surgeons in Europe.

About a year after the discovery of the anæsthetic power of ether, chloroform was introduced, and, from its fascinating qualities, seemed likely to displace ether, which had the disadvantage of being disagreeable to the smell and taste, and objectionable under certain circumstances, from its inflammability. Very soon, however, fatal accidents began to be caused by chloroform; many of them occurring where it was given for minor operations. The proportion of deaths has continued up to the present time, and may be estimated at about one a month for the last twenty years; which ratio seems scarcely reduced by the use of any care or ingenuity.

Dr. John C. Warren and myself introduced into practice, and used for about five years, concentrated chloric ether, pre-

* OFFICERS OF THE MASSACHUSETTS GENERAL HOSPITAL, 1846. — William Appleton, *President*; Theodore Lyman, *Vice-President*; Henry Andrews, *Treasurer*; Marcus Morton, Jr., *Secretary*.

Trustees. — Charles Amory, William T. Andrews, Nathaniel I. Bowditch, George M. Dexter, Robert Hooper, Thomas Lamb, Francis C. Lowell, John A. Lowell, Henry B. Rogers, J. Thomas Stevenson, J. Wiley Edmands, Edward Wigglesworth.

Board of Consultation. — James Jackson, M.D.; John Jeffries, M.D.; George C. Shattuck, M.D.; Edward Reynolds, M.D.

Visiting Physicians. — Jacob Bigelow, M.D.; Enoch Hale, M.D.; John B. S. Jackson, M.D.; Henry I. Bowditch, M.D.; John D. Fisher, M.D.; Oliver W. Holmes, M.D.

Visiting Surgeons. — John C. Warren, M.D.; George Hayward, M.D.; Solomon D. Townsend, M.D.; J. Mason Warren, M.D.; Samuel Parkman, M.D.; Henry J. Bigelow, M.D.

OF THE MCLEAN ASYLUM. — Luther V. Bell, M.D., Physician and Superintendent.

pared by distillation after a process recommended by Dr. A. A. Hayes. It had the advantage of being very agreeable to the taste, not inflammable, easily manageable, safe, and a good substitute for chloroform. Its liability to adulteration, and some accidents which subsequently occurred, probably from that cause, after its use became extensive through the country, led us to abandon the responsibility of recommending it, and to return to the use of sulphuric ether.

Ether was first administered by an apparatus. The use of this was inconvenient, especially with children, and led me to administer it on a simple sponge, which immediately took the place of the apparatus everywhere. The sponge first used at the Hospital is still preserved there.

In the course of twenty years, as already stated, not a single death can be fairly attributed to the use of sulphuric ether. In the Massachusetts General Hospital alone, it has been employed over twenty thousand times, without a single unfavorable occurrence. In some cases, particularly in young persons and females, I have seen disagreeable and troublesome symptoms occur from prolonged etherization. From the great frequency of the use of artificial teeth, the following not unusual accident may be mentioned. In one instance, after operating upon a lady, under ether, for a tumor of the thigh, I found her in an apparently dying state; respiration having almost ceased, and the pulse being just perceptible. Passing my finger down the throat, in order to admit a current of air to the larynx, I discovered an entire upper set of artificial teeth closely forced down on the glottis. These being withdrawn, it was only after a long persistence in the use of the usual remedies employed to recover a person from drowning, that the regular course of respiration and circulation was restored. She then became violently delirious for a time, but recovered well. I have once or twice, in the course of etherization, found artificial teeth loose in the mouth; and now generally inspect it previously, when I have suspicions of their presence.

Patients subjected to long operations — such as difficult vesico-vaginal fistula in women, and cases requiring perineal section in men — should be allowed, from time to time, to

partly recover from the ether, and get a supply of fresh atmospheric air into the lungs. Otherwise, from the position of the patient, which interferes with the abdominal respiration, and from the system becoming completely saturated with the anæsthetic agent, I have seen an unpleasant and prolonged depression occur a number of times, causing considerable anxiety.

For army use, chloroform will undoubtedly take the place of ether. From the prejudice in favor of ether in this country, it was thought that, during the late war, it might be substituted for chloroform. This, in practice, has been found not to be the case; the greater portability of the latter outweighing its dangers. In fact, to a surgeon on the field of battle, it would probably have been found necessary to have abstained from the use of anæsthetics, if such a bulky and explosive article as ether had required transportation.

The following is the result of the use of anæsthetics in the army, as given in Circular No. 6:—

“There have been consulted, in regard to the employment of anæsthetics, the reports of 23,260 surgical operations performed on the field or in general hospitals. Chloroform was used in sixty per cent of these operations, ether in thirty per cent; and, in ten per cent of the cases, a mixture of the two was administered. At the general hospitals, the greater safety of ether, as an anæsthetic, was commonly conceded. It was often employed, and no fatal accident from its use has been reported. In the field operations, chloroform was almost exclusively used. The returns indicate that it was administered in not less than eighty thousand cases. In seven instances, fatal results have been ascribed, with apparent fairness, to its use.”

In six of these fatal cases, the operations were trifling; and in one only was it administered for a capital operation.

In civil practice, ether will probably, from its greater safety, gradually take the place of chloroform; and this is already being done in some of the great cities and hospitals abroad. Professor Pétrequin, ex-chief surgeon of the Hotel Dieu, of Lyons, has recently presented to the French Academy of Sciences an article styled, “Clinical Studies on the Injurious Effects of Chloroform on the Best Constitutions and all Ages, and on the Necessity of substituting for it Rectified Ether.”

It will be observed, that the supporters of chloroform lay much stress on the method of its administration by an instrument, or otherwise, in order to measure the quantity given, and proper admixture with atmospheric air, from the fear of dangerous consequences. No fear or precaution of this kind is to be apprehended or required in the use of ether. In fact, the more liberally it is poured on the sponge or towel at first, the more rapid and perfect is the etherization,—the intermediate stage of excitement being avoided,—and the quicker the patient expels it from the system after the operation. In children who resist violently, one or two screams so effectually empty the lungs of atmospheric air, which is at once replaced by the vapor of ether, that insensibility is almost immediate.

Previous to a surgical operation, — which, it may be here said, is always best done in the morning, unless forced otherwise by circumstances, — the patient should take no solid food; thus avoiding the occurrence of vomiting, which not only depresses him, but much embarrasses the proceedings of the operation.

After the operation, it is best to leave the patient to recover gradually, and perhaps to sleep off the effects of etherization, rather than to rouse him suddenly, and subject him to excitement, nausea, or headache.

A caution may be given in regard to the inflammability of ether, during the night, where artificial light is necessary for the performance of operations, and in obstetric cases. In one instance, while operating at the Hospital at night on a mutilated finger, the lamp being three feet distant, and a sponge placed over the patient's mouth, the air in the vicinity became saturated with the ether, ignited, setting fire to the sponge, bed-clothes, and even face of the patient. The flames were fortunately, in this case, extinguished without any injury to the patient, but not without causing great fright to those in the neighboring beds. In another instance, the same accident took place from the introduction of a red-hot iron into the mouth of a patient, from whom the sponge containing ether had just been withdrawn. The flames were fortunately at once extinguished with water, which was immediately at hand. These accidents need only to be mentioned to be avoided.

The importance of having the ether properly prepared and thoroughly washed, so as to free it from alcohol and other irritating substances, should be carefully looked to. Otherwise, the action of it is disagreeable at the time, highly irritating, and its subsequent unpleasant effects more protracted. This was a fact early pointed out to me by Dr. Charles T. Jackson.

The anæsthetic action of cold, developed by a refrigerating mixture of ice and salt, as suggested by Mr. Arnott, may be advantageously substituted for etherization in many cases of slight operations confined to the skin and subcutaneous tissues. The operation must be performed quickly, as the parts thaw with great rapidity as soon as the warm blood begins to flow from the divided vessels. For operations requiring nice dissection, the method is inapplicable, owing to the rigidity of the frozen parts. There are many cases, however, especially minor operations, which present themselves at the house of the surgeon, which scarcely authorize the disturbance of the system or delay which the administration of ether would require. For these, local anæsthesia is of great value.

In 1852, I operated, at the Massachusetts General Hospital and elsewhere, with Mr. Arnott's freezing mixture of pounded ice and salt; and, from that time to the present, have frequently used it, as have many other surgeons in this vicinity, both for removing small tumors, and making incisions in inflamed tissues. It is best applied by placing the mixture in small bags of gauze, and having a number ready to be applied successively, rather than to depend on a single one; the freezing process, by this means, being more rapidly produced. Lately, a much more convenient method of effecting complete local insensibility has been demonstrated by Dr. Richardson, of London, by the invention of an apparatus for the rapid evaporation of ether, applied to the diseased part. This has been improved on by Dr. H. J. Bigelow, by substituting an agent which he has named rhigolene, which produces a much more rapid reduction of temperature than any other substance hitherto employed. A temperature of -16° of Fahrenheit can be arrived at in one minute with this substance.

One of the objections which, it was thought, would prevent the free use of rhigolene was its inflammable nature, and the danger of explosion in warm weather; its boiling point being at 70° . I have kept it during the summer, used it in many cases, and have thus far experienced no accident, nor heard of any occurring. I have tried it in cases of cancer of the lip, face, and nose; and, with proper management, and sufficient time for its successive application, it might be employed in the removal of large tumors involving superficial textures.

The nitrous-oxide gas is now being very extensively used by the dentists of this city; its inhalation being much facilitated by recently improved valvular apparatus, which allows of the constant supply of the gas unmixed with the pulmonary exhalations. Thus far, I am not aware of any fatal results from its use. It is very pleasant to inhale, and the recovery from its effects is usually immediate. It is very doubtful, however, that it will be adopted for any of the greater operations in surgery.

INDEX.



I N D E X.

A.

Abdomen, Chapter V.
 " Gunshot Wound of, 561.
 " Stab in, 570, 571.
 Absence of Vagina and Uterus, 306, 308.
 Adipose Tumor of Hand, 521.
 " Tumors of Spermatic Cord, 248.
 Air-passages, Foreign Bodies in, 96.
 Alden, Dr., 345.
 Allarton, Mr., 223.
 Amputation of Arm, 386, 390, 461.
 " of both Thighs, 401.
 " Hip-joint, 402, 407.
 " of Leg, 391, 392, 394, 395.
 " Shoulder-joint, 387-389.
 " of Thigh, 395, 397, 400, 523, 524, 525, 527, 565.
 Amputations, 384.
 " Table of, 409.
 Amussat, M., 197, 204.
 Anæsthesia, Local, 621.
 Anæsthetics, Chapter XIV.
 Anandale, Mr., 612.
 Aneurism by Anastomosis, 443, 451, 457.
 " of Abdominal Aorta, 437.
 " of Popliteal Artery, 433.
 " of Subclavian Artery, 425, 427, 429.
 " of Thoracic Aorta, 434.
 " Varicose, of Hand and Arm, 461.
 Aneurismal Tumors and Ligature of Arteries, 424.
 Anus, Chapter VI.
 " Artificial, 168, 169, 175, 177.
 " Fissure of, 186-189.
 " Fistula of, 191.
 " Imperforate, 196, 198, 199, 201, 202.
 " Prolapse of, 194.
 Appendix Vermiformis, Gangrene of, 575.
 Arm, Tumor of, 519.
 Arnott, Mr., 460, 621.
 Arteries and Veins, Chapter IX.
 Artery, Vertebral, Wound of, 553.
 Avery, Mr., 129.
 Axilla, Tumor of, 518.

B.

Bacon, Dr. John, 212, 213.
 Ball, Dr., 592.

Barnes, Surgeon-General U. S. A., 542.
 Bartlett, Dr. Josiah, 433.
 Barton's Operation, 417, 420.
 Beaumont, Mr., 223.
 Bell, Benjamin, 197.
 " John, 441, 442.
 Bennet, Dr., 75.
 Bennett, J. Hughes, Dr., 480.
 Bérard, M., 488.
 Bigelow, Dr. Henry J., 462, 617, 621.
 Bladder, Stone in, 204-226.
 " Wound of, 241.
 Blake, Dr. J. G., 163.
 Bodenhamer, Dr. William, 201.
 Bond, Dr. Henry, 321.
 Bowditch, Dr. H. I., 147, 149, 151.
 Boyer, M., 332.
 Brain, Concussion of, 16.
 Breast, Cancer of, 512, 514, 515, 517.
 " Chronic Inflammation of, 511.
 " Cystic Tumor of, 509.
 " Erectile Tumor of, 510.
 " Male, Tumor of, 518.
 Briggs, Dr., 41, 497, 616.
 Broadbent, Dr., 483.
 Bronchus, Foreign Bodies in, 97, 100, 102, 104.
 Brown, Dr., 169, 173.
 Brown, Dr. Buckminster, 154, 292, 424, 430, 573.
 Bryant, Mr., 230, 348.
 Buck, Dr., 323.
 Bumstead, Dr., 339.

C.

Cabot, Dr. Samuel, 108, 354, 363, 404, 533, 587, 595.
 Calculus, Cystic Oxide, 212, 214.
 " Oxalate of Lime, 207, 209, 216, 220, 223.
 " Renal, in Female, 304.
 " Salivary, 94.
 " Triple Phosphate, 218, 221.
 " Vesical, in Female, 303.
 Cancer, Epithelial, 47, 481.
 " of Breast, 481, 482, 512, 514, 515, 517.
 " of Ear, 59.
 " of Eye, 55, 56.
 " of Genitals, 244.
 " of Lip, 49.

Cancer of Nose, 52.
 " of Parotid, 490, 491, 493.
 " of Rectum, 243.
 " of Tongue, 93.
 " of Tonsils and Throat, 125.
 " of Vulva, 272.
 " Table of Operations for, 536.
 Cancerous Tumors of Jaw, 80.
 Carotid, Ligature of left, 439.
 Carotids, Ligature of both, 446.
 Cases of Trephining for Epilepsy, Table of, 15.
 Cellular Tissue, Induration of, 600.
 Cervix Uteri, Hypertrophy of, 294, 299.
 Chancre of Lip resembling Cancer, 51.
 Cheek, Erectile Tumor of, 534.
 " Recurrent Tumor of, 499.
 Chest, Gunshot Wound of, 550, 560.
 " Stab in, 570, 571.
 " the, Chapter IV.
 Cheever, Dr. D. W., 203, 501.
 Chloric Ether, 617, 618.
 Chloroform, 613, 617, 618.
 Circular No. 6, 542, 569, 619.
 Civiale, M., 204, 212.
 Clark, Dr. Henry G., 108, 162, 557, 570.
 Coale, Dr., 586.
 Coccyx, Injuries of, 593-596.
 Collis, Mr., 129, 131, 135.
 Concussion of the Brain, 16.
 Congenital Fusion of Fingers, 609.
 Cooper, Mr. Bransby, 376.
 " Sir Astley, 204, 324, 332, 354, 358, 359, 376, 449.
 Cord, Tumors of Spermatic, 248.
 Costello, Mr., 487.
 Coulson, Mr., 120.
 Cox, Dr., 200.
 Crampton, Sir Philip, 135.
 Cranium, Fractures of, 1.
 " Wound of, 6, 555.
 Crepitation of Tendons, 580, 581, 582.
 Crosby, Dr. Josiah, 323.
 Croup, 108.
 Cruikshank, Mr., 466.
 Curling, Mr., 252.
 Curtis, Dr., 586.
 Cuyler, Dr., Surgeon U. S. A., 544.
 Cystic Tumor of Breast, 509.
 " " of Jaw, 72.
 " " of Tibia, 522.
 " " of Vagina, 273.

D.

Damon, Dr. H. F., 501.
 Davidson, Dr. H. E., 110.
 Delpeck, 36.
 Depression of Skull, 7-9, 12.
 Desault, M., 323.
 Deviation of Septum Nasi, 62.
 Dickson, Dr. R. E., 70, 139.
 Dieffenbach, 18, 19, 29, 129, 134.
 Digital Nerve, Excision of, 475.
 " " Neuralgia of, 475, 476, 477.
 Dislocation of both Thighs, 364.
 " of Elbow, Lateral, 362.
 " of Femur, Dorsal, 364-366, 368-370.

Dislocation of Femur backwards, and probably downwards, 381.
 " of Femur into Foramen Ovale, 364, 378, 379.
 " of Femur downwards, 372.
 " of Femur, Perineal, 369, 371.
 " of Femur, with Fracture of Socket, 381.
 " of Shoulder backwards, 358.
 " of Shoulder forwards, 354, 356, 360.
 " of Shoulder, with probable Fracture of the Socket, 357, 361.
 Dislocations, 348.
 " Table of, 384.
 Drowning, Resuscitation after, 598.
 Dupuytren, M., 72, 73, 120, 168, 170, 206, 220, 222, 322, 458.
 Dyer, Dr. Ezra, 312, 406, 408.

E.

Ear, Epithelial Cancer of, 59.
 " Fibrous Tumor of, 59.
 " the, 59.
 Elbow, Lateral Dislocation of, 362.
 Ellis, Dr. Calvin, 11, 305, 315, 404, 499, 503, 524, 556.
 Enchondroma of Finger, 520.
 Encysted Tumor of Tongue, 92, 93.
 Epilepsy, Trephining for, 7.
 " " Table of Cases, 15.
 Epithelial Cancer, 47, 481.
 " " of Nose, 52.
 " " of Vulva, 272.
 Epulis, 70.
 Erectile or Vascular Tumor, 441.
 " Tumor of Breast, 510.
 " " of Cheek, 534.
 " " of Ear, 457.
 " " of Face and Neck, 446.
 " " of Hand and Arm, 461.
 " " of Head, 451.
 " " of Knee, 460.
 " " of Mouth, 462.
 " " of Scalp, 443.
 Erichsen, Mr., 73, 223, 376, 406.
 Ether, 613, 614, 616, 617.
 " First Operation under, 615.
 Excision of External Condyle of Humerus, 410.
 " of Joints, 409.
 " of Joints, Table of, 423.
 " of Knee-joint, 412, 415, 416, 417, 420.
 " of Shoulder-joint, 411, 423.
 Extraction of Needles, 590.
 Extremities, the, Chapter VIII.
 Eye, Cancer of, 55.
 " " of, Melanotic, 56.
 " the, 55.
 Eyelid, Restoration of Lower, 42.

F.

Face and Neck, 504.
 " and Orbit, Tumor of, 499.
 " Horn upon, 61.
 " the, Chapter II.

Femur, Dislocations of, 353, 364-382.
 Ferguson, Sir William, 69, 129, 132.
 Fibrous Tumor of Ear, 59.
 " Tumors of Jaw, 84.
 " Tumor of Thigh, 530, 531.
 Field, Mr., 129.
 Finger, Enchondroma of, 520.
 Fingers, Congenital Fusion of, 609.
 Fissure of Anus, 186.
 " of Palate, 126.
 Fistula in Ano, 191.
 " Urethral, from Wound, 235.
 " Vesico-rectal, 234, 242.
 " vaginal, 263-268.
 Fistulous Opening containing Hair, 192, 193.
 Flagg, Dr., 323, 616.
 Folts, Dr., 350.
 Foot, Malformation of, 612.
 Foreign Bodies in Air-passages, 96.
 " " in Esophagus, 112.
 " Body in Vagina, 276.
 Fox, Dr., 320.
 " J. L., Surgeon U. S. Navy, 544, 552.
 Fracture of Arm, 331.
 " of Arm imitating Dislocation of Elbow, 362.
 " of Base of Skull, 3, 4, 597.
 " of Clavicle, 320.
 " of Coccyx, 595.
 " of Condyles of Humerus, 321.
 " of Epiphysis of Head of Humerus, 328.
 " of Femur, 323, 324, 341, 382, 516.
 " of Fore-arm, 331.
 " of Humerus ununited, 329.
 " of Malar Bone, 326.
 " of Malar Bone and Sup. Maxillary, 327.
 " of Neck of the Femur, 340-342, 345, 346.
 " of Neck of the Femur, with Inversion of Foot, 342.
 " of Patella, 322, 332-338.
 " of Pelvis, 339.
 " of Radius, 321, 330.
 " of Skull, 2, 6, 12, 555.
 " of Spine, 324.
 " of Superior Maxillary Bones, 327.
 Fractures, 318.
 " of Cranium, 1.
 Fungoid Tumor of Forehead, 483.

G.

Gangrene of Appendix Vermiformis, 575.
 Gay, Dr. G. H., 108, 404.
 Genital Organs, Cancer of, 244.
 Genito-urinary Organs, Chapter VII.
 " " Female, 258.
 " " Male, 204.
 Gensoul, 69.
 Gibbs, Mr., 118.
 Gibson, Dr. C. B., 545.
 Gilman, Dr., 86.
 Gordon, Dr. Charles, 547.
 Gould, Dr. A. A., 333, 616.
 Graefe, 18, 36, 126.
 Greeley, Dr., 372.

Green, Dr. John, 386.
 " Dr. S. A., 382.
 Groin, Wound of, 565.
 Gross, Professor, 72, 96, 97, 175, 246.
 Guérin, M., 603, 606, 607, 608.
 Gunshot Wounds (see Wounds), Chapter XII.
 Guthrie, Mr., 543, 569, 578.

H.

Hæmatocele, 252.
 Haighton, 466.
 Hale, Dr., 107.
 Hamilton, Professor, 319.
 Harelip, 143.
 Hayes, Dr. A. A., 618.
 Hayward, Dr. George, 164, 615.
 Head, Gunshot Wound of, 6, 543, 555.
 " the, Chapter I.
 " Tumor of, 483, 485-487.
 Hemorrhoids, 183-186.
 Hennen, 543.
 Hermaphrodism, 310.
 Hernia, 152.
 " Radical Cure of, 164-168.
 " Strangulated, 152-164.
 Heurteloup, M., 204.
 Heywood, Dr. C. T., 41.
 Hip and Spinal Diseases, 572.
 Hip-joint, Amputation at, 402, 407.
 Hodges, Dr. R. M., 313, 443, 462.
 Hooker, Dr., 10.
 Horn on the Face, 61.
 Horns, 60.
 Hosack, Dr. A. E., 270.
 Huguier, M., 294, 295, 298.
 Humerus, Amputation of, 386, 390, 461.
 " Dislocation of, 354, 356-358, 360, 361.
 " Excision of ext. Condyle of, 410.
 " " of Head of, 411, 423.
 " Fracture of, 331, 362.
 " " of Condyles of, 321.
 " " of Epiphysis of Head of, 328.
 " " of ununited, 329.
 Hutchinson, Mr., 49, 53, 270.
 Hydrocele, 251.
 " of the Neck, 509.
 Hydrophobia, 584.
 Hypertrophy of Cervix Uteri, 294, 299.

I.

Iliac Tumor, 179.
 Imperforate Anus and Rectum, 196.
 Inches, Dr. H. B., 37, 38.
 Indurated Tumor of Penis, 245-248.
 Induration of Cellular Tissue, 600.
 Injuries and Diseases of Nerves, Chap. X.
 " of Os Coccygis, 593-596.
 " of the Scalp, 15.

J.

Jackson, Dr. C. T., 615, 616, 621.
 " Dr. James, 181, 189.
 " Dr. John B. S., 109, 201, 313, 333, 526.

Jaw, Cancerous Tumors of, 80-84.
 " Cystic Tumors of, 72-80.
 " Fibrous Tumors of, 84.
 " Myeloid Tumors of, 64-70.
 " Necrosis of, 88-92.
 " Removal of Lower, 66, 70, 78, 82.
 " " of Upper, 67, 81, 82, 84.
 " Trephining Lower, 472, 474.
 Jaw-bone, Tumors of, 64.
 Joints, Excision of, 409.
 Jones, Dr., 461.

K.

Keep, Dr. N. C., 89.
 Knee and Elbow Joint, Gunshot Wound of, 563.
 Knee-joint, Excision of, 412, 415-417, 420, 423.
 " " Nævus of, 460.
 " " Needle penetrating, 590-592.

L.

Labat, M., 18, 28.
 Larrey, M., 543.
 Laryngitis, Tracheotomy in, 109.
 Larynx, Foreign Body in, 105.
 Latta, 197.
 Lawrence, William, Mr., 153.
 " William R., Dr., 60, 616.
 Lebert, M., 48.
 Leg, Amputation of, 391, 395.
 " Re-amputation of, 392, 394.
 " Wound of, 545, 548.
 Leucocythæmia, 479, 501.
 Lip, Cancer of, 49.
 " Cancers of, Table of, 51.
 " Upper Chancre of, 51.
 Lisfranc, M., 21, 351, 386.
 Liston, Mr., 18, 107, 386.
 Lithotomy, 204, 218-226.
 Lithotripsy, 204, 207-218.
 Local Anæsthesia, 621.
 Lothrop, Dr. J. R., 426, 428.
 Lungs, Wound of, 560, 564.

M.

Malformation of Foot, 612.
 Malgaigne, M., 322, 348, 349, 350, 352, 358.
 March, Prof., 72.
 Martin, Dr., 298.
 Melanosis of Eye, 56.
 " of Parotid, 491.
 Mercier, M., 223.
 Meyer, 466.
 Minot, Dr. Francis, 145, 158, 303.
 Miscellaneous Cases, Chapter XIII.
 Mons Veneris, Tumor of, 269.
 Morphia, Hypodermic Use in Neuralgia, 467, 468, 471, 472.
 Morton, Dr. W. T. G., 497, 500, 614-616.
 Mussey, Prof., 405.
 Myeloid Tumors of Jaw, 64.

N.

Nævus over Knee-joint, 460.
 Neck, Encysted Thyroid Tumor of, 506.

Neck, Hydrocele of, 509.
 " Thyroid Tumor of, 507.
 " Tumor of, 498, 502.
 " the, Chapter III.
 " Wound of, 544, 558.
 Necrosis of Jaw, 88.
 " of Skull, 576.
 Needle penetrating Knee-joint, 590-592.
 Needles, Extraction of, 590.
 Nélaton, M., 73.
 Nerve, Excision of Digital, 475.
 " Sciatic Wound implicating, 470.
 Nerves, Injuries and Diseases of, Chapter X.
 Neuralgia, Digital, 475-477.
 " Facial, 472, 474.
 " Traumatic, of Arm, 468, 471.
 Nitric Acid, Poisoning by, 578.
 Nitrous-oxide Gas, 622.
 Norris, Dr., 429.
 Nose, Deviation of Septum of, 62, 63.
 " Epithelial Cancer of, 52.

O.

Occlusion of Vagina, 278, 280, 284, 286, 287, 289.
 " of Uterus, 291, 292.
 Oesophagus, Foreign Bodies in, 112, 113.
 " Strictures of, 114-116.
 " Tumors in, 116.
 Officers of Mass. General Hospital and McLean Asylum, 1846, 617.
 Oliver, Dr. H. K., 111, 117, 119, 373, 377.
 Operation, Barton's, 417, 420.
 " Pancoast's, 164.
 " Pirogoff's, 392.
 " Syme's, 391.
 " Wutzer's, 167.
 Orbit, Tumor of, 57.
 Organs, Genito-urinary, Chapter VII.
 " " Female, 258.
 " " Male, 204.
 Otis, G. A., Surgeon U. S. V., 542.
 Ovariectomy, 300, 302.

P.

Page, Dr. C. G., 134.
 Paget, Mr., 47, 49, 270, 466, 524.
 Palate, Fissure of Soft and Hard, 126, 138, 140.
 Pancoast, Prof., 164.
 Paracentesis Thoracis, 146.
 Parker, Dr. Willard, 138, 583.
 Parkman, Dr. George, 497.
 " Dr. Samuel, 164, 497, 617.
 Parotid Region, Tumors of, 488.
 " Tumor of, 489, 490-493, 495, 497.
 " Scirrhus, 490.
 Parsons, Dr., 616.
 Patch, Dr., 105.
 Patella, Fracture of, 322, 332-338.
 Peirson, Dr. A. L., 143.
 Pelvis, Fracture of, 339.
 " Wound of, 551, 561.
 Penetrating Wounds of Chest and Abdomen, 569.
 Penholder removed from Bladder, 600.
 Penis, Indurated Tumor of, 245.

Penis, Wound of, 552.
 Perinaeum, Rupture of, 258, 260, 261.
 Perineal Section, 230-232, 234-236, 238, 240.
 Pétrequin, Prof., 619.
 Phimosis, 250.
 Physick, Dr., 175, 572.
 Pirogoff's Operation, 385, 392.
 Poisoning by Nitric Acid, 578.
 Pollock, Mr., 129, 131.
 Polypus of Rectum, 195, 196.
 " of Uterus, 274-276.
 Priestly, Dr., 316.
 Prolapse of Anus, 194.
 " of Bladder, 268, 269.
 " of Walls of Vagina, 268.
 Prostate, Diseases of, 240.
 Putnam, Dr. Charles G., 519.

R.

Radius, Fracture of, 321, 330.
 Rayer, M., 60.
 Re-amputation of Leg, 392, 394.
 Rectum and Anus, Imperforate, 196.
 " Cancer of, 243.
 " Polypus of, 195, 196.
 Recurrent Parotid Tumor, 497.
 Removal of Tonsils, 119, 121, 122.
 " of Lower Jaw, 65, 66, 70, 78, 82.
 " of Upper Jaw, 67, 81, 82, 84.
 Reid, Dr., 370.
 Renal Calculus in Female, 304.
 Restoration of Eyelid, Operations for, 42, 44.
 Resuscitation after Drowning, 598.
 Retained Testicle, 257.
 Reynolds, Dr. Edward, 37, 84, 616.
 Rhigolene, 621, 622.
 Rhinoplastic Operations, 18.
 Rhinoplasty, Indian, 19, 33.
 " Taliacotian, 30, 36.
 Richardson, Dr., 621.
 Richerand, M., 349.
 Robert, M., 376.
 Rodent Ulcer, 48, 53.
 Roux, M., 126, 129, 466.
 Rupture of Perinaeum, 258, 260, 261.
 " of Tendon of Quadriceps Femoris, 338.
 " Partial, of Tendon of Quadriceps Femoris, 582, 583.

S.

Salivary Calculus, 94.
 Sartorius Muscle, Tumor of, 529.
 Sawyer, Dr. A. A., 535.
 Scalp, Injuries of, 15.
 Schwerdt, 134.
 Scirrhus Tumor of Parotid, 490.
 Section, Perineal, 230-232, 234-236, 238, 240.
 Septum Nasi, Deviation of, 62, 63.
 Shattuck, Dr. G. C., 125.
 Shaw, Dr. B. S., 407, 527.
 Shoulder, Dislocations of, 348, 354, 356-358, 360, 361.
 " joint, Amputation at, 387-389.
 " " Excision of, 411.

Shurtleff, Dr., 616.
 Simpson, Dr., 301, 316, 597.
 Sims, Dr., 263.
 Skull, Fracture of, 2.
 " of Base of, 3, 4, 597.
 Slade, Dr. D. D., 41, 149, 497.
 Smith, Dr., 331.
 " Dr. J. V. C., 616.
 Smyly, Dr., 131.
 Souberbielle, Dr., 60.
 Spermatic Cord, Tumors of, 248.
 Stanley, Mr., 73, 376.
 Stearns, Dr. John, 584, 586, 589.
 Stone in Bladder (see Calculus), 204.
 Storer, Dr. H. R., 316.
 " Prof. D. H., 600.
 Stricture of Esophagus, 114.
 " of Urethra, Perineal Section for, 230.
 " of Urethra, with Retention, 226.
 Subclavian Aneurism, 425, 427, 429.
 Swan, 466.
 Swinburne, Dr., 323.
 Syme, Mr., 206, 230, 385, 409, 466, 483.

T.

Table of Amputations, 409.
 " of Cancers of Lip, 51.
 " of Dislocations, 384.
 " of Excisions of Joints, 423.
 " of Operations for Cancer, 536.
 " of Operations for Epilepsy, 15.
 Taliacotius, 18.
 " Operation by, Method of, 30, 36.
 Tartra, 580.
 Taylor, Mr., 580.
 Tendon, Partial Rupture of Quadriceps, 582, 583.
 " Rupture of Quadriceps, 338.
 Tendons, Painful Crepitation of, 580-582.
 Testicle, Retained, 257.
 Thigh, Amputation of, 386.
 " Dislocation of, 353, 354.
 " Fracture of, 323, 324.
 " Gunshot Wound of, 546, 565, 567.
 Thoracic Aorta, Aneurism of, 434.
 Thoracic Paracentesis, 146.
 Throat, Cancer of, 125.
 Tiedemann, 466.
 Tongue, Cancer of, 93.
 " the, 92.
 " Wound of, 552.
 Tonsils, Cancer of, 124.
 " Removal of, 119.
 Townsend, Dr. S. D., 37, 366, 617.
 Trachea, Foreign Body in, 105.
 Tracheotomy, 108, 109.
 Transposition of Organs, 125.
 Trephining for Epilepsy, 7-15.
 " for Neuralgia, 472, 474.
 Tubercle, Painful Cutaneous, 535.
 Tumor, Adipose, of Hand, 521.
 " of Cord, 248.
 " containing Air, 576.
 " Cystic, of Breast, 509.
 " of Tibia, 522.
 " of Vagina, 273.
 " Encephaloid, of Thigh, 525.

- Tumor, Encephaloid, of Tibia, 524.
 " Encysted, of Tongue, 92, 93.
 " " Thyroid, 506.
 " Erectile, of Breast, 510.
 " " of Cheek, 534.
 " " of Ear, 457.
 " " of Hand and Arm, 461.
 " " of Mouth, 462.
 " " of Mouth, Face, and Neck, 446.
 " " of Scalp, 443, 451.
 " Fungoid, of Forehead, 483.
 " Iliac, 179.
 " Indurated, of Penis, 245-248.
 " Malignant, of Thigh, 527.
 " of Arm, 519.
 " of Axilla, 518.
 " of Face and Neck, 504.
 " of Face and Orbit, 499.
 " of Head, 485, 487.
 " of Male Breast, 518.
 " of Mons Veneris, 269.
 " of Neck, 498, 502.
 " of Orbit, 57.
 " of Sartorius Muscle, 529.
 " of Thigh, 530-533.
 " Parotid, 489-493, 495, 497.
 " Recurrent, of Cheek, 499.
 " " Fibrous, of Ear, 58.
 " Thyroid, 507.
 " Vascular and Sensitive, of Female Urethra, 270, 271.
 " " or Erectile, 441.
 Tumors, Chapter XI.
 " Aneurismal, 424.
 " in Esophagus, 116.
 " of Jaw, 64.
 " " Cancerous, 80-84.
 " " Cystic, 72-80.
 " " Fibrous, 84.
 " " Myeloid, 64-70.
 " of Lower Jaw secondary to Removal of Cancer of Lip, 86, 87.
 " Parotid Region, 488.

U.

- Ulcer, Rodent, 48, 53.
 Urethra, Bougie retained in, 229.
 " Stricture of, Perineal Section for, 230-232, 234-236, 238-240.
 " " of, with Retention, 226, 228.
 Urethral Fistula from Wound, 235.
 Uterus and Vagina, Absence of, 306, 308.
 " Hypertrophy of Cervix of, 294, 299.
 " Occlusion of, 291, 292.
 " Polypus of, 274-276.

V.

- Vagina and Uterus, Absence of, 306-308.
 " Foreign Body in, 276.

- Vagina, Occlusion of, 278, 280, 284, 286, 287, 289.
 " Prolapse of Walls of, 268.
 " Tumor of, 273.
 Varicocele, 254-257.
 Varicose Aneurism of Hand and Arm, 461.
 Vascular or Erectile Tumor, 441.
 Velpeau, M., 212, 483, 581, 582.
 Venous Erectile Tumor of Mouth, 462.
 Vesical Calculus in Female, 303.
 Vesico-rectal Fistula, 234, 242.
 " vaginal Fistula, 263-268.
 Virchow, Rudolf, Prof., 480.
 Vulva, Cancer of, 272.

W.

- Walshe, Dr., 48, 124.
 Warren, Dr. J. Collins, 535.
 " Dr. John, 143, 206, 489.
 " Dr. John C., 81, 107, 122, 124, 126, 162, 189, 206, 219, 346, 353, 372, 376, 377, 450, 454, 474, 479, 483, 485, 488, 497, 518, 583, 605, 614-617.
 Wheeler, Dr., 6.
 White, Dr. J. C., 53.
 Whitton, John, 396.
 Wild, Dr., 587.
 Williams, Dr. H. W., 390.
 Wilson, Dr. E. T., 89.
 Wood, Mr. John, 164.
 Woodward, J. J., Ass't Surgeon U. S. A., 542.
 Wound of Abdomen, 570.
 " of Carotid Artery, 439.
 " of Chest, 570, 571.
 " of Neck and Abdomen, 571.
 " of Palmar Arch, 440.
 " Gunshot, of Abdomen, 561.
 " " of Bladder, 241.
 " " of Chest, 550.
 " " of Elbow and Knee, 563.
 " " of Groin, 565.
 " " of Head, 6, 543, 555, 556.
 " " of Leg, 545, 548.
 " " of Lungs, 560, 564.
 " " of Neck, 544, 558.
 " " of Os Calcis, 545.
 " " of Pelvis, 551, 561.
 " " of Penis, 552.
 " " of Thigh, 546, 565, 567.
 " " of Tongue, 552.
 " " of Vertebral Artery, 553.
 " " followed by Neuralgia, 468, 470, 471.
 Wounds, Gunshot, Chapter XII.
 Wry Neck, 601, 605.
 Wutzer's Operation for Hernia, 167.
 Wyman, Dr. Morrill, 147.

Y.

- Youatt, Mr., 587.

E R R A T A.

Page	46.	line	6,	for	"plain,"	read	"plane."
"	55,	"	last,	"	"iris,"	"	"cornea."
"	60,	"	7,	"	"encondromatous,"	"	"enchondromatous."
"	66,	"	18,	"	"zigoma,"	"	"zygoma."
"	83,	"	19,	"	"objections,"	"	"objection."
"	86,	"	18,	"	"similating,"	"	"simulating."
"	101,	"	13,	"	"mucus,"	"	"mucous."
"	284,	"	27,	"	"pubis,"	"	"pubes."







